MAY • 1948

Vol. 5 • No. 5

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Editor and publisher, DANA CHASE. Associate editors, PROF. A. I. ANDREWS and PROF. R. M. KING.

Acceptance under the act of June 5, 1934, at Aurora, Illinois, authorized January 7, 1948.

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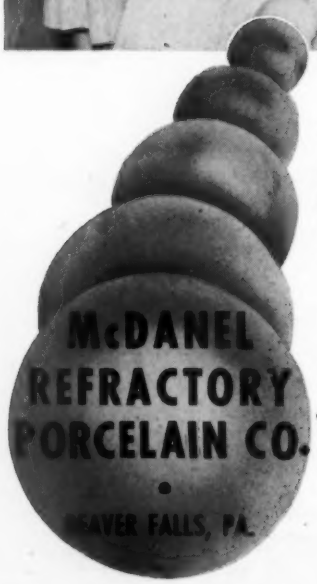

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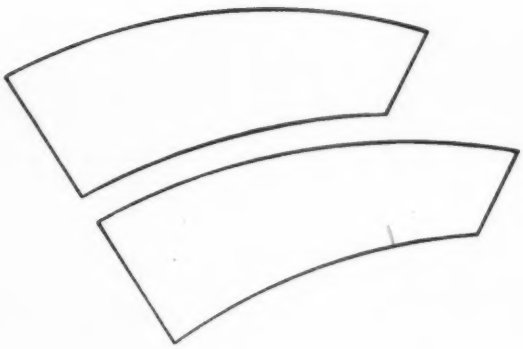

SIZE IS OFTEN AN ILLUSION

Consider two factories for example. One of them is really big — covers a lot of ground — has many pieces of scattered equipment some of which are often idle.

The other factory is compact — machines are modern — arranged in an orderly sequence — working most of the time.

Nine times out of ten, the small shop can give you better work, all the capacity you want and prompt shipments.

The centrally located Vitreous plant at Nappanee, Indiana, is not one of the largest in the industry. It is, however, thoroughly modern and efficient. It is geared to produce beautiful work that has pleased our customers, some of whom have been buying from us since we started more than 25 years ago.

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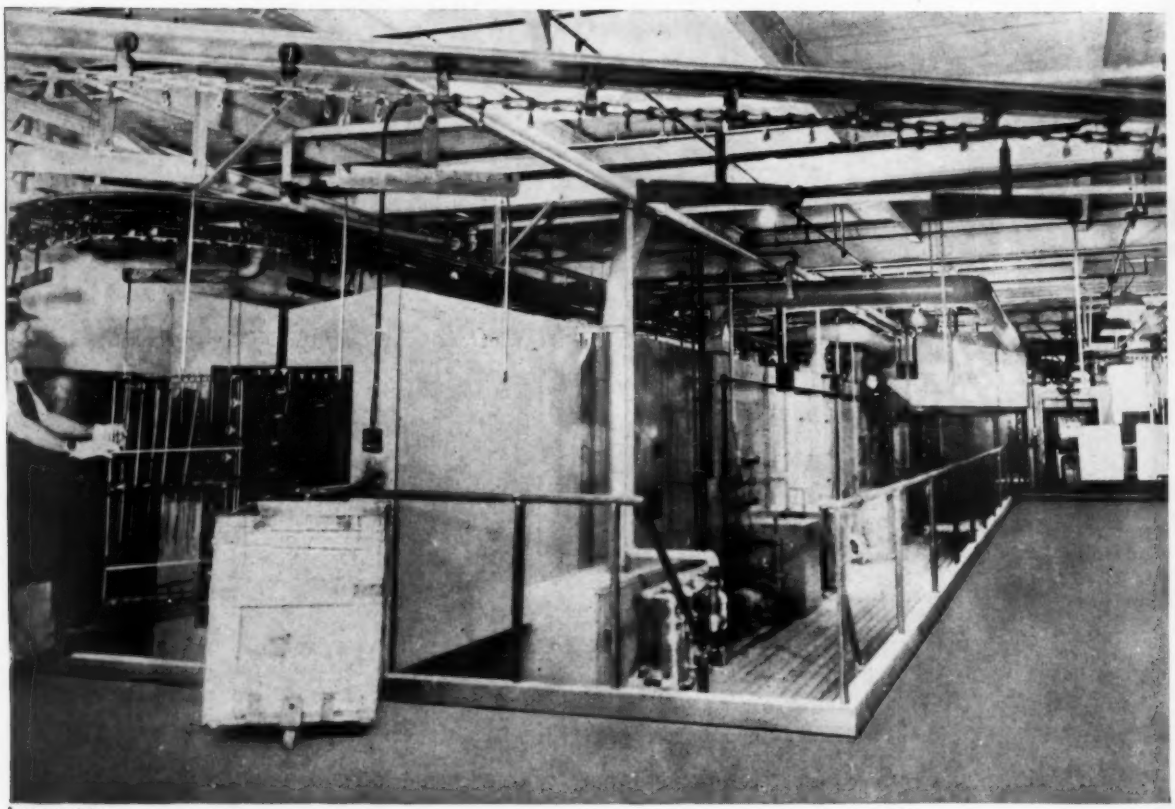

A METALWASH Spray Pickler processing ranges in the plant of a leading American manufacturer

METALWASH AUTOMATIC SPRAY PICKLING EQUIPMENT

Above is another example of METALWASH Spray Pickling Equipment which has revolutionized pickling procedure prior to porcelain enameling. This complete, compact unit washes, rinses, pickles, nickel coats, neutralizes and dries stove bodies and washing machine parts.

The use of powerful pumps, specially designed nozzles and proper venting systems produces uniform, cleanly pickled surfaces with greatly improved adherence qualities and the optimum in working conditions. Fully automatic operation reduces handling, increases production, and permits accurate control of time cycles and temperatures to produce continuous, uniform pickling and nickel coating.

Further information on METALWASH engineered spray pickling equipment will be furnished upon request.

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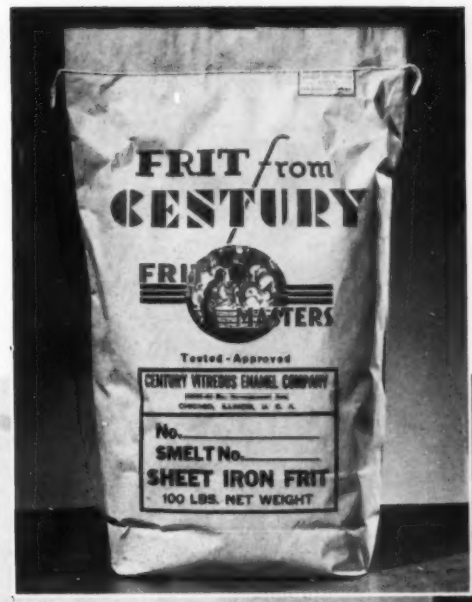
TIME-PROVED



THE Century laboratory is always working to improve frit formulas. Experienced personnel conducts the necesary research for the development of up-to-date frits. Each frit gets careful laboratory testing before it is tried in production.

Laboratory tests are not enough. Every Century frit you buy has also been tested and time-proved in production enameling plants before it offered for sale.

Laboratories are important, and ours has played a big part in 16 years of progress in frit making. To this, add production experience and knowledge of practical enameling problems, and you have two big reasons for the success of Century enamels in production plants.

Let us discuss your problems with you.

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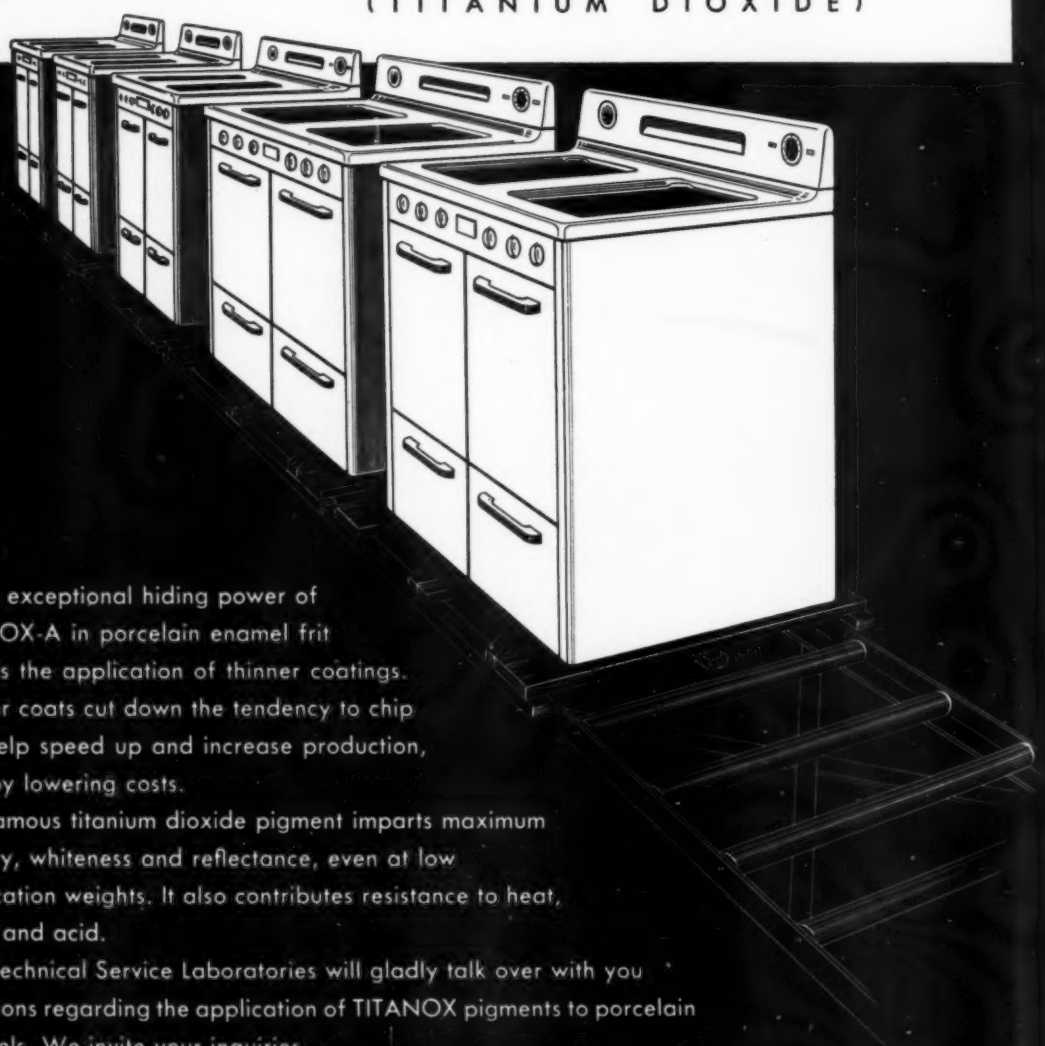

The exceptional hiding power of TITANOX-A in porcelain enamel frit permits the application of thinner coatings. Thinner coats cut down the tendency to chip and help speed up and increase production, thereby lowering costs.

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IT'S HUYCK FOR BUILDING...OR...REBUILDING

The new enameling furnace at Blume Porcelain Enameling Co., Chicago, Illinois.

★ ★ ★ ★ During December of 1946, Huyck completed a contract with Blume Porcelain Enameling Company covering the rebuilding of a 30 year old box type porcelain enameling furnace that had not been in operation for over 13 years. Completed, the rebuilt furnace produced first quality porcelain enamelware and is continuing to give satisfaction in regular daily production.

★ ★ ★ ★ In January of 1947, Huyck built a completely new box type furnace in the same plant. This new furnace is also turning out quality enameling and is built to produce good work for many, many years to come. Like all Huyck furnaces, it is built to last.

★ ★ ★ ★ Yes, it's Huyck for Building, for Rebuilding, or, in fact, for every kind of a masonry job that may come up in a Porcelain Enameling plant. If you have a job coming up, large or small, it will pay you to get in touch with us now.

HUYCK CONSTRUCTION COMPANY

2946 North 78th Court • Phone: GLadstone 3-8604

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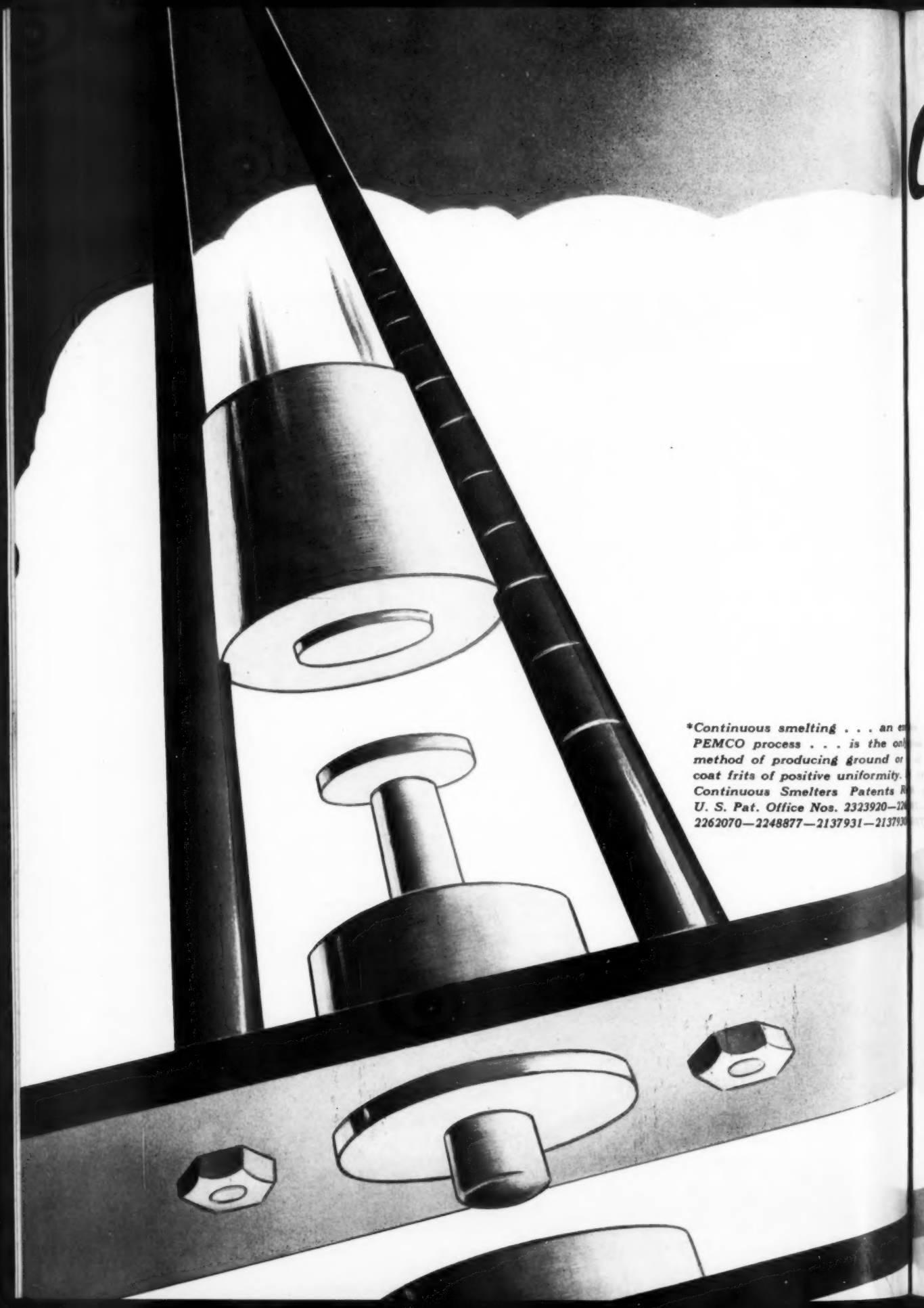

*Continuous smelting . . . an e
PEMCO process . . . is the on
method of producing ground or
coat frits of positive uniformity.
Continuous Smelters Patents R
U. S. Pat. Office Nos. 2323920—22
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A hundred pounds of DESTRUCTION

As troubles try the hearts of men, so this little unit tests the soul of porcelain enamel. With the speed of an express train it plunges a bolt into a test panel to determine the value of its finish for quality, uniformity and low-end cost to you, the user. Testing, testing, testing! with methods always a bit ahead of the parade. Nothing is taken for granted. It must be better or it will never join the Pemco family of products.

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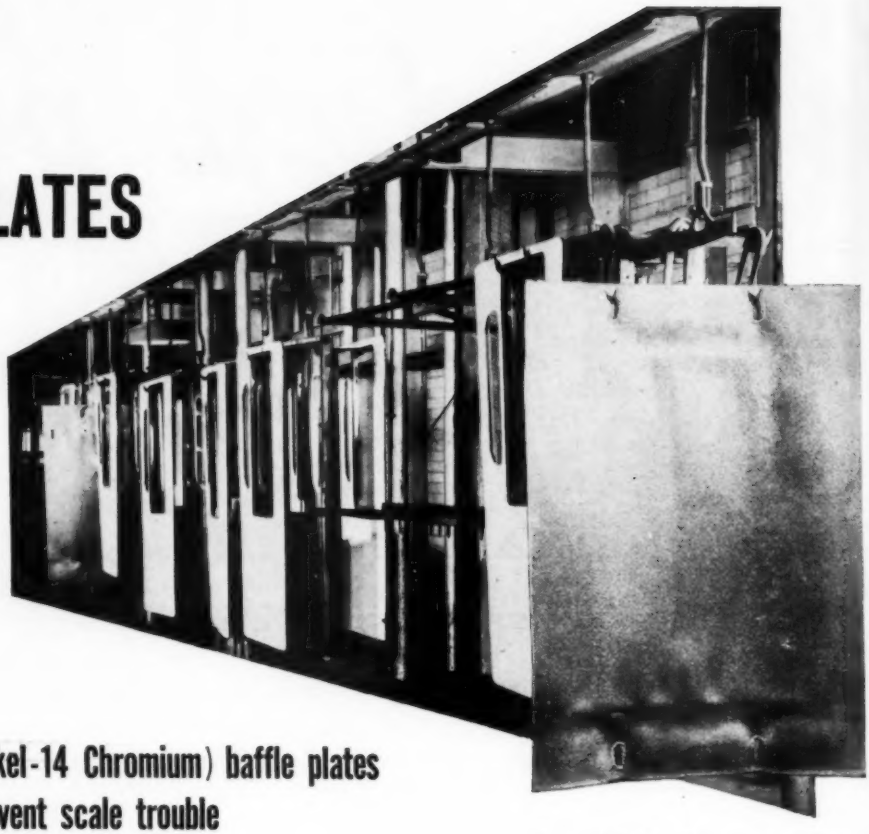
Baltimore 24, Maryland

Always Begin With a Good Finish

WHERE BAFFLE PLATES ARE NEEDED



"INCONEL" (80 Nickel-14 Chromium) baffle plates cut heat losses... prevent scale trouble

Inconel Baffle plates made by Ferro-Enameling Corp. spaced at intervals to reduce radiation losses.

Bothered with the problem of proper material for baffle plates?

Then here's a tip from the Norris Stamping and Manufacturing Co., Los Angeles.

Use Inconel.

Norris Stamping tried many materials for baffle plates . . . with the same results. They rapidly scaled away under high enameling heats. Finally they tried Inconel. And their baffle plate worries were over.

Here's why!

Because this high nickel alloy is anti-spalling. Its tightly adhering oxide doesn't scale off to spoil freshly enameled surfaces.

Because Inconel has good thermal endurance . . . withstands high temperatures . . . stays on the job longer.

And Inconel is economical. This long-lived, anti-spalling, high-nickel alloy compares in cost to other high-temperature alloys.

Remember Inconel in connection with other enameling equipment . . . hanger bars, burning tools, and fixtures. If you've a special problem, write us in detail. INCO engineers will be glad to help you with its solution.

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THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall Street, New York 5, N.Y.

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★ FRIT

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OHCO FRITS — There is a Hommel frit for your every requirement. Made from the finest raw materials obtainable, each individual blend combines the best properties demanded in a finish with bonding strength.

OHCO CLAYS — Hommel 842 powdered enameler's clay has an incomparable research and performance test record.

OHCO OXIDES — Hommel enameling oxides are always uniform in color value and strength. Perfect color matching is an invaluable service you get from Hommel.

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Our Technical Staff and Samples are available to you without obligation. Let us help you with your problems.

World's Most Complete Ceramic Supplier

THE Finish Line

This page of *finish* is usually reserved for the "blurbs" and "mind wanderings" of the editor. However, from among the stacks of letters and potential editorial material that cross our desk, we found a little gem that to us was worthy of reprinting here with the author's permission.

We offer it for two reasons: First, it offers a bright spot in style contrasting with the current tone of the news and the "heavy" reading which every manufacturer and businessman encounters today; secondly, it most certainly carries a moral of extreme importance to every producer in our industry — or any industry, for that matter.

The author is R. O. Eastman, of The Eastman Research Organization, New York City. If you start reading it, we are sure you will read it all.

Sermon in a Toilet Seat

"Sweet are the uses of adversity:
Which, like the toad, ugly and venemous,
Wears yet a precious jewel in his head;
And this our life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything."

So this is a sermon in a toilet seat.

It all started when mama tore her nylons, and that's *adversity* if ever there were such a thing, as every man knows who has a woman who has nylons.

On inspection we found that the plastic covering had lifted at precisely the right spot to turn the seat into a perfectly superb nylon snagger.

A couple of days later when the reverberations from the explosion had died away, and when I had seen my first robin and my soul was particularly mellow, and I had decided that in spite of the hard winter, the Roosians, the price of steak and John L. Lewis, life was still going to be worth living, I sat down and wrote Mr. Church a letter.

I told him how when I refurbished the house I bought a year ago I got me a new toilet seat in which I took great pride and joy. How, being a Church, I felt it was as safe as a church, as I knew that, whatever the embarrassment, he stood behind every seat he made.

I pictured my amazement and sorrow when it suddenly developed a propensity for chewing up nylons. I didn't ask for anything but advice. Figuratively speaking, I just laid my seat in his lap.

I told him how I had toyed with the idea of repairing it myself with a bit of white enamel (being very handy with a paint brush) but had refrained because after all Mr. Church might not like it. Then it wouldn't belong to Church any more, which would make it something of a renegade.

This morning I got a phone call from which I have not yet recovered. A voice with a smile that would do credit to the whole Bell Telephone System said, "This is the manufacturer of a renegade seat."

He asked me a few questions which I answered. There was a touch of pain in his smiling voice when he said, "A Church seat just shouldn't do that. It goes through fourteen inspections." And then —

"What address shall I mail this to?"

So this is the sermon

First the heartening evidence that there are still men in this world of moral shabbiness who value the honor of their name above the profit from a sale. Who make their products as good as they can, and then when the product fails, as all human wares sometimes will, make good themselves, not grudgingly but as if it were a privilege. Who count the making of friends as worthy and as necessary an end as the making of money.

These are the exalted among the children of men, for theirs is the eminence of faithful service.

Then perhaps there's a moral to be drawn respecting the efficacy of a healthy sense of humor and a spirit of tolerance.

For if I'd written Mr. Church, as in another mood I might have done, a querulous, sputtering, table pounding complaint —

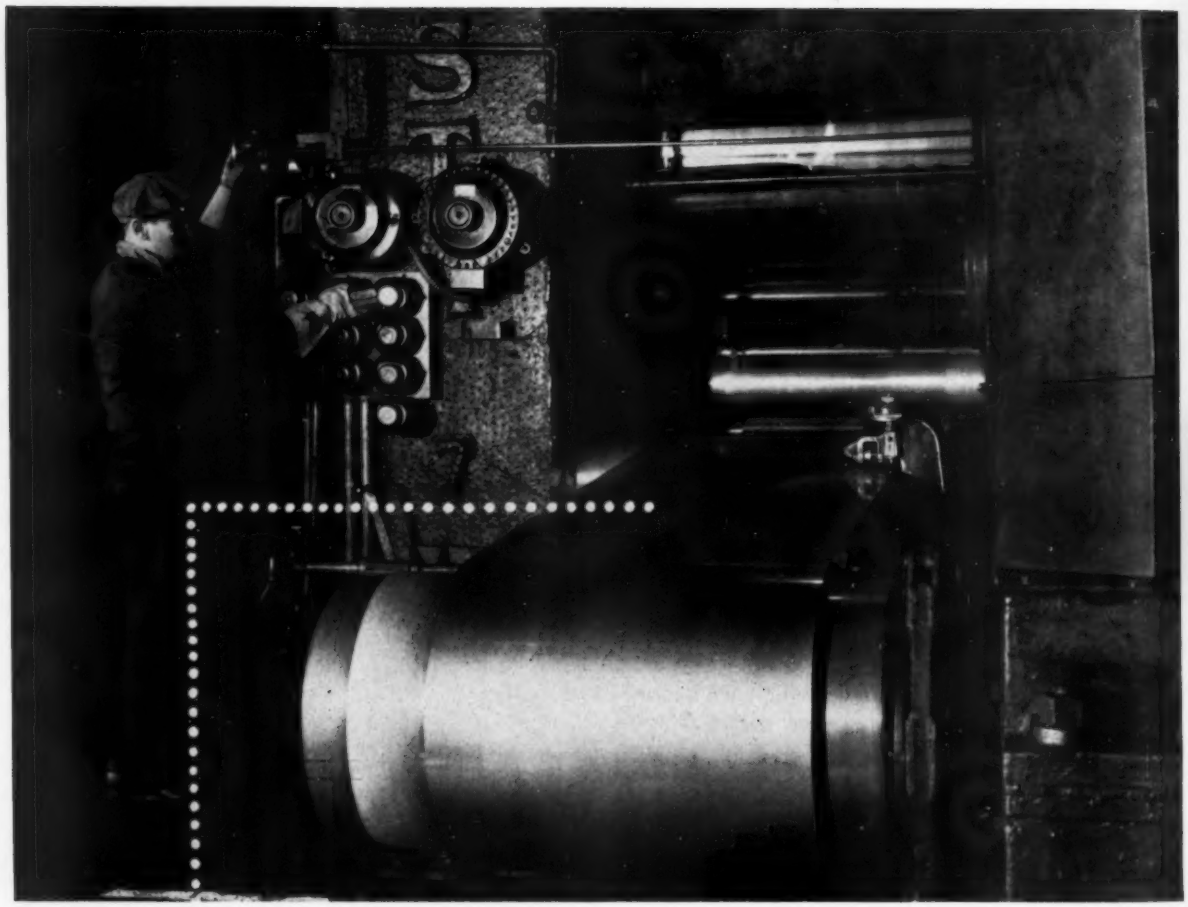
I'd probably still be mad, and he'd probably be mad, I probably wouldn't be getting a new toilet seat, and you wouldn't be getting this letter.

What this country, and every other country on the face of this tired and bewildered earth, needs every bit as much as churches with pulpits and steeples is more Churches with honest toilet seats.

While *finish* readers may not make the toilet seats, they make practically everything else that goes in the bathroom — not to mention the kitchen, laundry and basement. We suggest a moment in retrospect.

Dana Chase

EDITOR AND PUBLISHER



Made Flat -- Stay Flat

You can be sure that Inland Enameling Iron Sheets will meet the requirements for flatness your products may demand. Rigid control assures this. The metal must be up to Inland's uniformly high standards before it leaves the open-hearth furnaces. It must be maintained at Inland's high standards as it is rolled, under constant tension, in modern rolling mills. It is especially processed to keep it free from internal strains. Continuous testing and inspection by experienced Inland metallurgists assure you of a uniformly high quality enameling iron sheet.

In addition, the use of Inland Enameling Iron Sheets produces better enameling results because of "double-tight" adherence, sag resistance, and correct chemical composition. We are striving to increase our production of these quality sheets in order to meet the unusual demand for them. INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

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A continuous furnace enameling plant for commercial refrigerators

offering conclusive proof that 12-foot parts for commercial refrigerators can be successfully porcelain enameled in a continuous furnace operation

By E. B. Flowers • ENAMEL PLANT SUPERINTENDENT, THE WARREN COMPANY, ATLANTA, GA., AS TOLD TO *Dana Chase*

finish

The Warren Company has long been an exponent in the use of porcelain enamel for commercial refrigeration equipment, for it has been found through many years of use (the company is now 66 years old) that there is no other finish or product that offers the brilliant white exteriors so resistant to continuous use and repeated cleaning. In our business, sanitation is of the utmost importance, and that is why we use porcelain enamel to so great an extent on the company's wide line of refrigerators, coolers, display cases, and frozen food units.

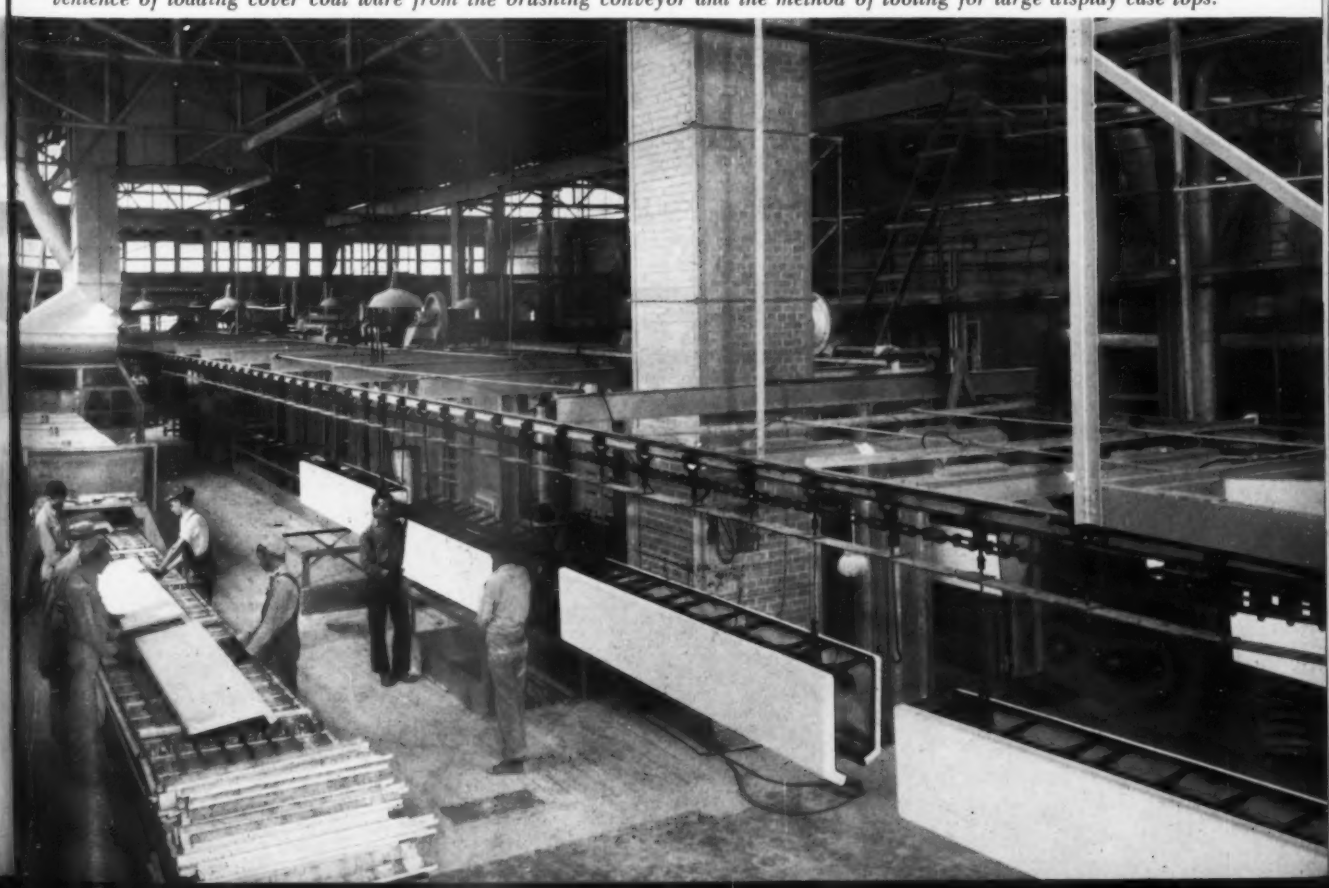
White is standard for most of the line where foods are to be stored. Black porcelain enamel has been used effectively for florists' coolers.

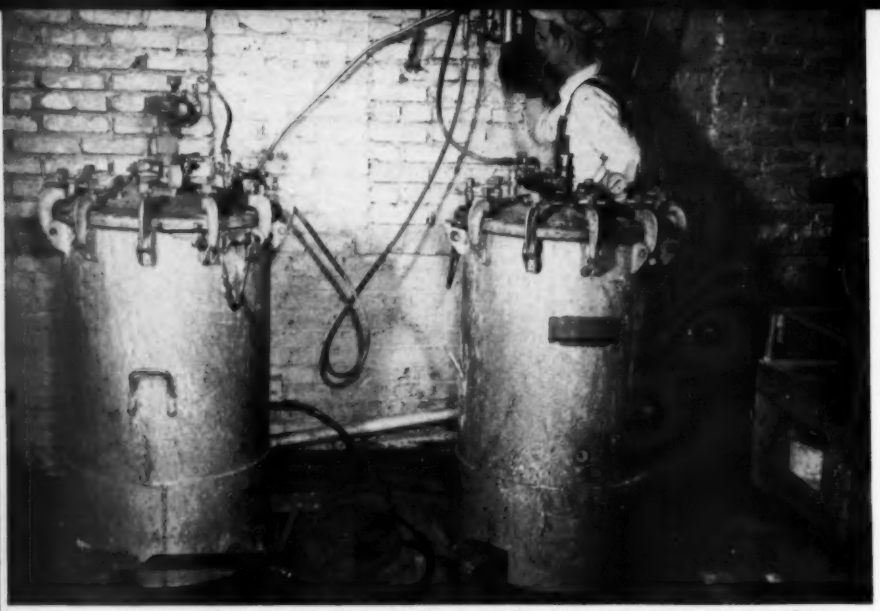
It can't be done!

Our company has operated a 2-box furnace porcelain enameling plant for 14 years to produce the required parts for the complete line. With increased production requirements, the desirability of a continuous production line became increasingly apparent. In a study of the problem, the opinion was voiced by many in the industry that it would be impractical to attempt to fire some of the larger shapes in a continuous furnace. This was a problem to consider, as our parts vary in size from 2″ wide by 24″ long to 48″ wide by 12′ long.

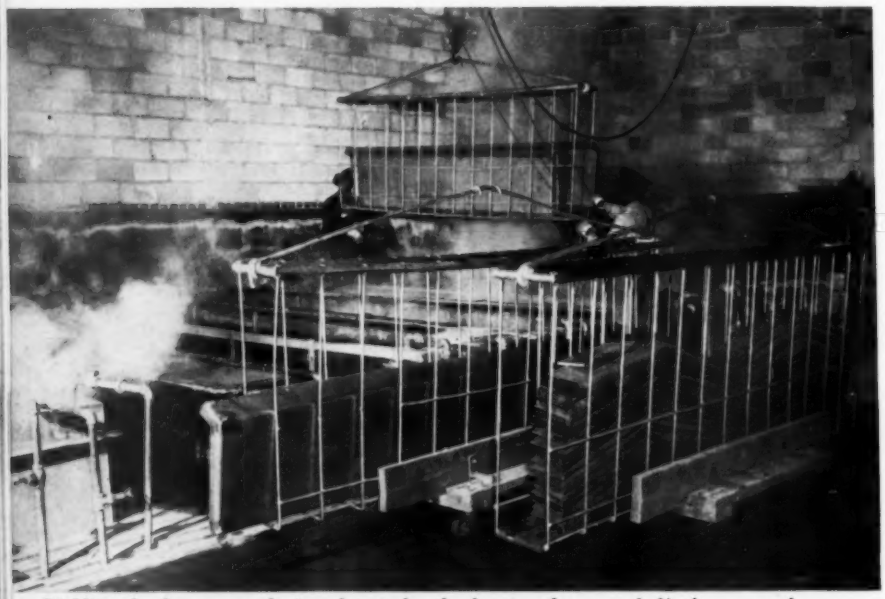
In our early study of the problem, we visited a number of continuous furnace plants and weighed the comparable problems in the plants visited with those we might encounter in pro-

This general view of one section of the Warren Company porcelain enameling plant shows the exit end of the finish coat dryer and brushing conveyor at left, and the entrance end of the continuous furnace at right. Notice the convenience of loading cover coat ware from the brushing conveyor and the method of tooling for large display case tops.





Cover coat enamel is piped from pressure tanks to automatic spray machine.



Pickling baskets were designed to take the long and unusual display case shapes.

finishfotos

Loading continuous furnace chain. Note proximity to exit end of ground coat dryer.

duction of larger commercial parts.

It was finally decided in May, 1947, to design a plant to eliminate, insofar as possible, the trucking and manual handling of parts. Engineers were called in to design such a plant and to incorporate a continuous furnace in the design.

While the new plant has been in production only a comparatively short time, results have been very satisfactory.

Ground coat, white fired together

Enamels used include a low temperature ground coat and zircon cover coat, both being fired from 1500 to 1510° F. Fifty to sixty per cent of the ware is produced in one coat white. The biggest reason for the balance of the ware requiring two coats is one of design.

A good many of our parts are so designed that they require considerable brushing, and some have black and white sections on the same panel. This, of course, calls for considerable handling. It is planned that eventually practically all parts will be designed for white only, with brushing practically eliminated.

Handling enamel slip

The millroom is located at basement level, with one section of it directly under the automatic spray booth for cover coat. All enamels are unloaded by air through centrifugal sieve and magnetic separator into portable galvanized storage tanks of 60-gallon capacity. These tanks have stainless steel liners.

One mill room feature which might be termed unique is the method of handling cover coat enamel for the automatic spray line. Pressure tanks are prepared in the millroom and located at a point immediately below the automatic machine. The enamel is then piped directly from the pressure tanks to the spray booth above. A "speaking tube," consisting of pipe with funnel connection, affords communication between millroom control man and spray foreman.

Pickle baskets, tanks to fit ware

One feature of our pickle room which may seem unorthodox is the

unusual shape of our pickling baskets and tanks. For instance, the tanks are 30″ in width, and have uniform depth and length of 52″ and 14′, respectively. Baskets have outside dimensions of 15″ wide by 50″ deep by 11′ long.

The baskets are of Monel rod and tube construction. Top frames are of 1¼ I.P.S. tubing, and the framework is ⅝″ rod. Hangers for the baskets are 1″ rod. The baskets are handled through the pickle cycle with a manually operated electric hoist.

Ventilation is provided by two 42″ Monel fans mounted at the roofline. All tanks are set in a pit, the front wall of which is of grillwork construction, to permit a draft of fresh air through the tunnel and plenty of ventilation at the sides of the tanks.

As will be apparent, baskets and tanks were designed to meet the requirements for long, wide shapes, so many of which are required for commercial display cases.

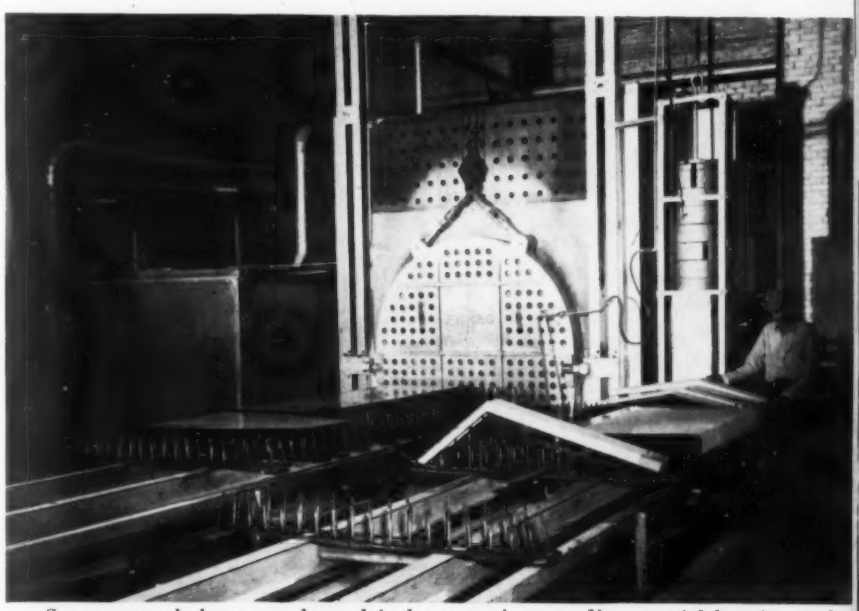
Nine solution tanks

There are nine solution tanks as follows: 1st cleaner, 4% sodium oxide (by titration), boiling; 2nd cleaner, 8% sodium oxide (by titration), boiling; cleaner rinse, 160° F.; two acids, 6% sulphuric at 160-180° F.; acid rinse, cold running water; nickle, ⅛ oz. single nickel salts per gallon, about 160-180° F.; neutralizer, .2 to .3% sodium oxide (by titration); and the 9th tank is a dryer.

We believe in a light pickle, and the time is approximately 10 minutes.

Our nickle tank practice was worked out by a graduate student from Georgia Tech. Data procured indicated that there is no benefit to be gained by a higher concentration of nickel or a close control of pH or temperature. During the study, tests were run for a period of six months with a test panel in every basket. We do dump the tanks every second day and recharge. No interim additions are made. The reason that this seems practical to us is the small size of the tanks, and the low concentration of the solution. Total capa-

Entrance of pressurized spray room housing automatic spray machine for cover coat.



Some unusual shapes are burned in box type furnace. Note special burning tools.

finishfotos

Ed Flowers points to "roller" hangers which give necessary "play" at radius turns.

finishfoto

Thomas G. Smith, left, assistant to the president, and Virgil P. Warren II, works manager, inspect the latest of the company's products which is currently being released for the market. This new porcelain enameled all-purpose "three-way" case is for fresh vegetables requiring high humidity, dairy products and general cold storage. Each compartment provides different humidity and different temperature.

city of these tanks is approximately 900 gals.

Ground coat sprayed automatically

Immediately adjacent to the pickle room is a manual booth for spraying backs of all parts with ground coat. Ware is then transferred immediately to a laydown cable conveyor feeding an automatic spray machine. The automatic and two staggered edging booths, which immediately follow, are housed in a pressurized room fed by filtered, heated air. There is no attempt to spray edges with the ground coat, either in the manual spray booth or the automatic. The black edging applied in the staggered booths is applied direct on the metal.

A gas-fired, ventilated tunnel dryer, 35′ long, follows. The dryer is maintained at 300° F. through the use of seven tubular gas burners, each having its own individual gas pilot. Conveyor speed is variable, but is normally run at 9′ per minute to synchronize with other production facilities.

The unloading end of the ground coat conveyor is at a point where the ware can be immediately transferred to the furnace conveyor chain just a few feet from the entrance end of the furnace.

The furnace is of straight-through design, with an opening 30″ wide by 56″ high. It has a pre-heat zone of 35′, a firing zone of 25′-6″ and a cooling zone of 35′.

Inasmuch as the loading point for cover coat ware precedes ground coat loading on the chain, alternate hangers are left open for ground coat loading. At the exit end of the furnace the furnace chain parallels a transportation conveyor serving the assembly line. At this point all parts to receive black only are inspected and transferred immediately to this chain.

Editor's Note:

It is a compliment to porcelain enamel as a finish that this sixty-six year old manufacturer of commercial refrigerators, and one of the four largest producers in the country, should install a completely new and modern continuous enameling plant. The Warren Company was building refrigerators almost a quarter of a century before automobiles outgrew the name "horseless carriage," and more than two decades before the Wright Brothers performed their feats at Kittyhawk.

From the founder, Commodore V. P. Warren, to L. C. Warren, Sr., present company president, and on through the organization, policy has called for quality and "keeping up with the times." The new porcelain enameling plant exemplifies both of these points.

Cover coat application

Parts fired in ground coat which are to receive white travel around the end loop of the furnace conveyor and are transferred to racks feeding a manual spray booth, where reclaim white is applied to backs only. They are then loaded immediately on the lay-down conveyor feeding the cover coat automatic.

Design of this spray room—including automatic and two edging booths—is exactly the same as the one described for ground coat, except that the cable conveyor is considerably longer.

The cover coat dryer is heated by seven burners, each with individual automatic control.

At the exit end of the dryer the conveyor continues over a down draft brushing grill equipped with high pressure suction along the full length of the brushing area. Brushers work on both sides of the conveyor, and practically everything is brushed on the moving cables at production speed.

The outside loop of the furnace chain parallels the brushing conveyor so that parts are transferred direct to the chain. As indicated previously, only alternate hangers are loaded with cover coat ware. The furnace chain normally travels at 10′ per minute, with the firing temperature at 1500° F.

Inspection

After firing, inspection of first coat white is at the take-off point with immediate transfer to the transportation conveyor. All white that gets second coat completes the furnace chain loop and is transferred immediately to the automatic spray con-

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See plant layout . . . Pages 36 & 37

Why G-E specifies porcelain enamel
in its dealer identification program

By F. Russell Metcalf • VISUAL MERCHANDISING SUPERVISOR, APPLIANCE & MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONN.

INSTALLATION BY PORCELAIN ENGINEERING COMPANY, CHICAGO

An outstanding example of the use of porcelain enamel in modern facades is the General Electric showroom at the American Furniture Mart in Chicago. For instant recognition and striking appearance, G-E used its official blue lifetime letters against a grey background, with the monogram in orange and white.

finish

Meeting competition—competition that exists *now* — is just a matter of knowing what makes people buy — and doing it. And in General Electric Company's way of "doing it," porcelain enamel plays a large part.

During the past few years the story of most appliance stores has echoed the tale of Topsy—for like her, they "just grew." They grew as the dealer made room for more and more new appliances that appeared on the market, and for new signs that blossomed in his windows. The result was a confusing, eye-jarring pile of stuff. Identities were weakened or sometimes even completely lost.

As the need for visual merchandising became more apparent, General Electric consulted the Walter Dorwin Teague Business Research Organization with the question, "What makes people notice one store and not even see another?"

The answer, according to the Teague survey, was this: "Retail

The Teague survey pointed out that retail store fronts must give a "unified, clean, distinctive impression" to make them noticed by the customers.

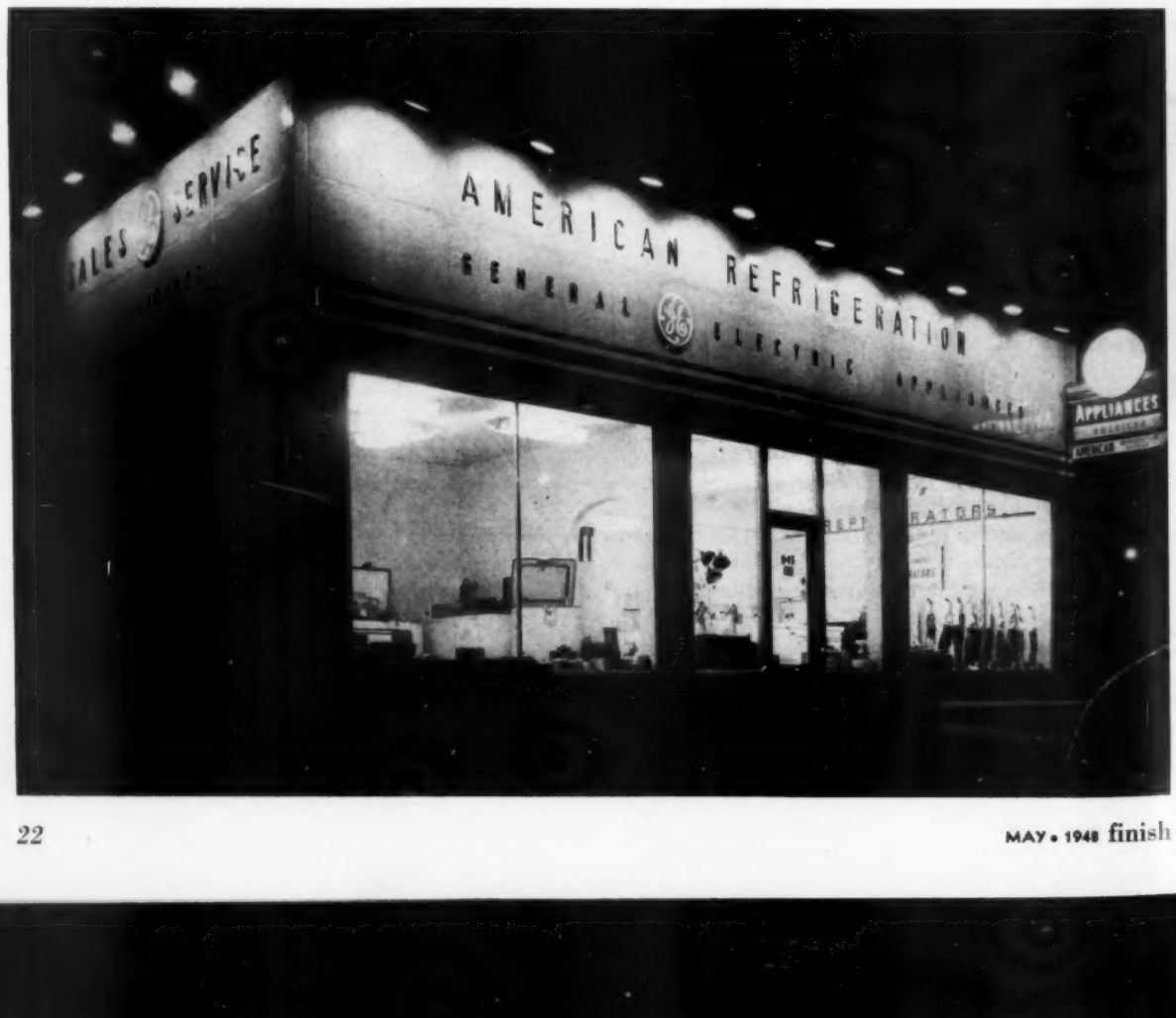
stores, in their very effort to attract attention, have defeated their own purpose; a disordered frenzied clamor for attention, in which nothing can be heard for the shouting, should give way to a unified, clean, distinctive impression."

G-E augmented this research with surveys made by its own advertising agency and its own research department through analysis of its own experience and the experience of its dealers. Then it became known what an appliance store should look like —and why.

To produce the striking identification motiff needed by its retail outlets throughout the country, the company used all its facilities, plus those of its advertising agency. The result was a complete program of coordinated design, including every level of identification, from packaging to interior and exterior store modernization.

Porcelain enameled cast-aluminum letters used

An exclusive porcelain-finish cast-aluminum letter was developed after



Illustrating General Electric's sign treatment of the wide store with entrance in front center, American Refrigeration, Hartford, Conn., makes use of several of the available porcelain enameled identification pieces. The double-faced projecting illuminated sign is built around the latest lighting developments. The orange and white monogram is illuminated by coral-colored fluorescent tubing, and "Appliances" is illuminated from within, spilling light on the porcelain enamel dealer name panel.

years of research with E. I. du Pont de Nemours & Co., Inc. Designed to last a lifetime, it cannot rust or wear out. The modern letter was chosen for tastefulness and visibility, as were G-E's official colors—grey, dark blue, orange and white.

A complete service from truck signs to store fronts

With this as a basis, General Electric designed a number of signs for store fronts, trucks and roadside use. Special service was set up to provide dealers, who plan modernized store fronts, with scaled layouts of the proposed facade, as recommended by the identification program. The district sales manager forwards photographs of the present store front, with overlays showing the actual dimensions of available sign area, to the General Electric Visual Merchandising Section. Here a new front is superimposed on the photograph, and blueprints of the suggested changes are drawn up.

These then go back to the distributor, who submits them to the retailer for approval. The okayed blueprint is returned to Visual Merchandising, and this department works with the fabricator in transferring the blueprint to the actual panels. The dealer receives the complete sign, ready for mounting.

Raised porcelain enameled letters, applied directly to the side of a truck, are recommended for their greater permanency.

The recommended front is of high luster porcelain enamel over 18-gauge steel. Chosen for its beauty and durability, because it is permanent and easy to clean, porcelain enamel translates into simple attractive terms the impression of quality and dependability for G-E retail outlets.

For those dealers who are not ready for complete porcelain store fronts, the company has produced a custom-built porcelain panel sign of the same high quality. So successful has this been that 90% of those dealers participating in the program

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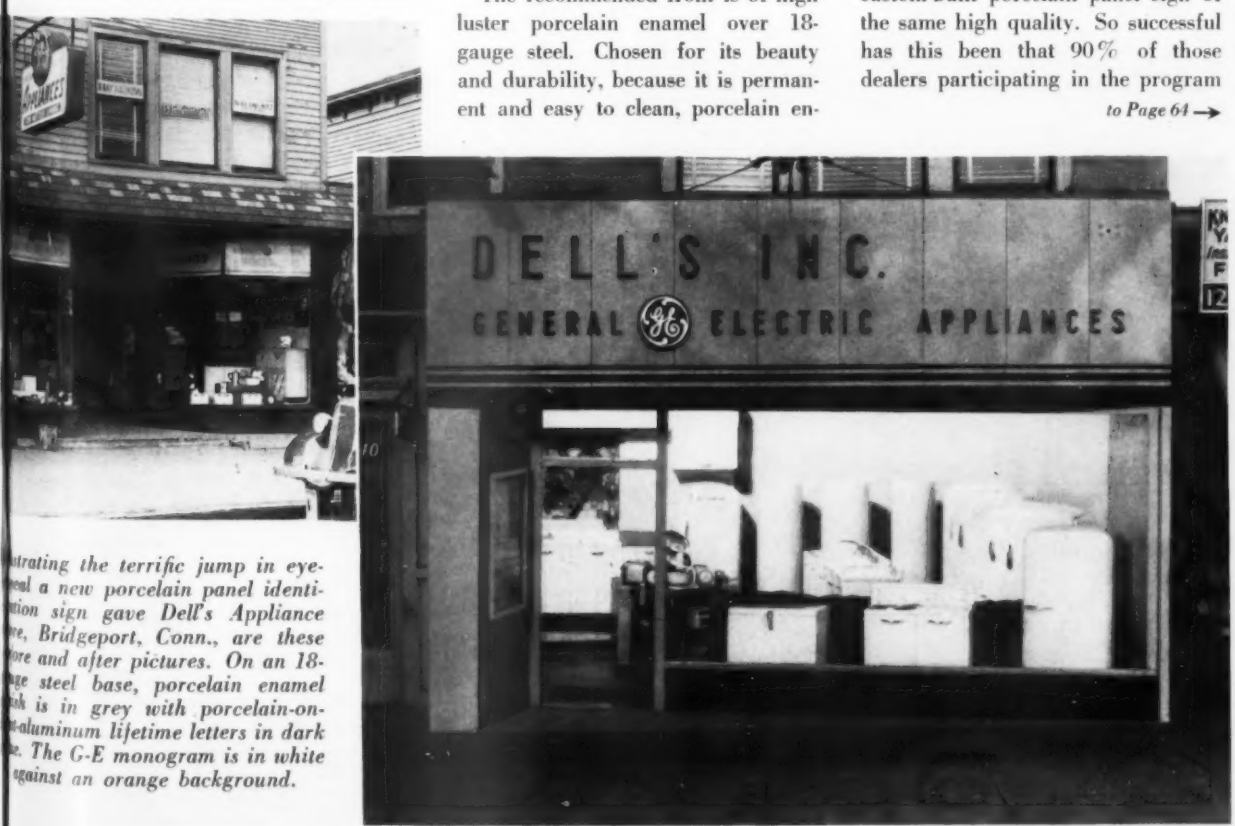

...strating the terrific jump in eye-...eal a new porcelain panel identi-...tion sign gave Dell's Appliance ...re, Bridgeport, Conn., are these ...ore and after pictures. On an 18-...ge steel base, porcelain enamel ...sh is in grey with porcelain-on-...-aluminum lifetime letters in dark ...e. The G-E monogram is in white against an orange background.

The "chimney furnace"—

another new use for porcelain enamel

new circulating heating system has porcelain enameled "heat exchanger"

ONE of the latest applications of porcelain enamel in the home heating field is in connection with the development of an oil burner which fits in a conventional brick chimney and serves as a "furnace" for home heating.

The product of Chimney-Furnace Corporation, Rockville, Maryland, consists of a steel chamber 14" in diameter and 32" high. It is designed to fit inside the chimney of almost any house being built under current housing programs. (The manufacturer points out that the "chimney furnace" has been accepted by the Federal Housing Administration for use in FHA-financed homes.)

The "furnace" has a vaporizing type burner which projects its flame directly upward into a vertical *porcelain enameled* steel flue. The fire is contained entirely within the steel tube and burner. The flue may extend up the chimney from 12 to 20 feet, depending upon the height of the chimney.

Forced circulation

In operation, the system delivers warm air at the bottom instead of the top. A blower fan located above the first floor draws air from ceiling-high room vents, then forces the air down through a 2-inch air space between the flue or "heat exchanger" and the brick walls of the chimney. As the air passes along the porcelain enameled steel flue, it is heated and then delivered to the rooms through direct openings and ducts at floor level.

A specially developed application combines radiant or warm floor heat with forced warm air. In this spe-

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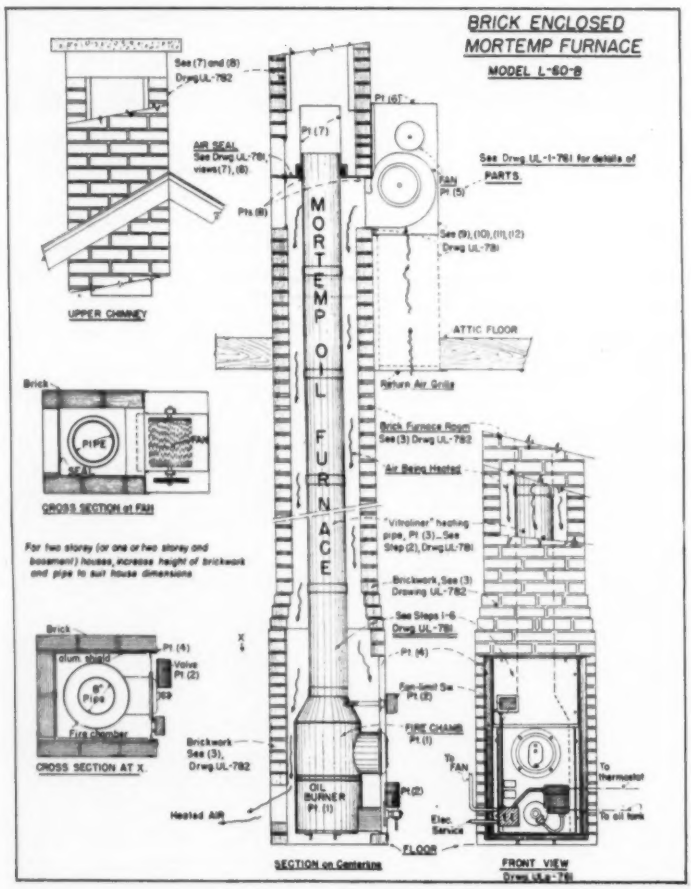
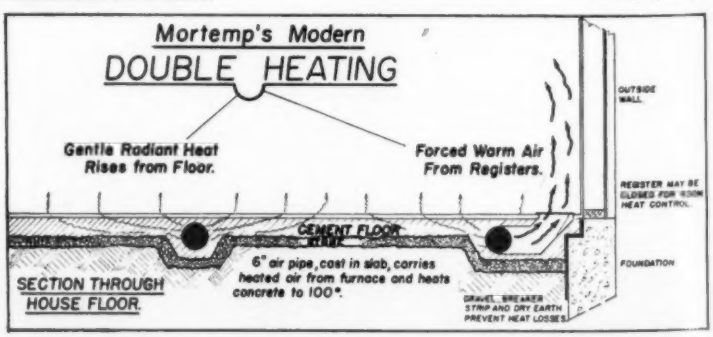


Above: Illustration shows how oil burner fits in brick chimney and serves as a "furnace" for home heating.


Mortemp's Modern
DOUBLE HEATING
Gentle Radiant Heat Rises from Floor.
Forced Warm Air From Registers.
CEMENT FLOOR
6" air pipe, cast in slab, carries heated air from furnace and heats concrete to 100°.
SECTION THROUGH HOUSE FLOOR.
OUTSIDE WALL
REGISTER MAY BE CLOSED FOR ROOM HEAT CONTROL
FOUNDATION
GRAVEL BREAKER STRIP AND DRY EARTH PREVENT HEAT LOSSES

Right: A specially developed application combines radiant or warm floor heat with forced warm air.

Architects are a MARKET

understand their buying procedure and sales will come easily

By Don Graf • B.S., M. ARCH.

Exclusive feature finish

What is an architect? What does he do? Is he important? How do you sell him?

What is an architect? The word architect has nothing to do with arches—it comes from the Greek *arthos* meaning chief. If we accept Kipling's dictum, it is safe to say that architecture is the world's *second* oldest profession, a numerical proximity that has been suggested as not entirely without significance.

There is a popular lay conviction that an architect is a man who makes blueprints. Then there is the little girl who, having had experience with artichokes, defined an architect as something green outside with nothing inside!

Nothing to learn!

A famous writer named Vitruvius wrote in 30 B.C. that an architect "ought to have a knowledge of letters, be expert in drawing, learned in geometry, not ignorant of optics, be instructed in arithmetic, well read in history, to have diligently attended to philosophy, to have a knowledge of music, not a stranger to physics, understanding in law, and be conversant with astronomy and the aspects of the heavens."

Outside of this the architect had nothing to learn!

The modern architect might be described as a professional man or organization engaged in translating an owner's needs into *design*, and *design* into *structure*.

Design in a building means strength, utility, and beauty. Combining materials and equipment skillfully produces these three essential qualities in the finished structure. Between design and structure, there must be *products*. As a building product with distinctive properties, porcelain enamel can be an important contribution to contemporary architectural design.

Is the architect important?

A ten billion dollar market has

Don Graf is an authority on technical subjects pertaining to building. He was graduated in architecture from the University of Minnesota and with a graduate degree from Harvard Architectural School. Graf has engaged in active architectural practice in the Middle West, Florida, New England, and New York.

The first complete survey of construction methods for the erection of porcelain enamel steel panels was carried out by him for inclusion in the standard architectural reference book, the "Don Graf Data Sheets." He also has acted as consultant on design, promotion, and advertising of building products for many of the country's leading manufacturers.

At present he is Building Editor of one of the leading American consumer magazines. His first article for *finish*, "Easy Marketing," appeared in the August 1947 issue. In this, his second article written especially for *finish*, he offers basic information of first importance for all who are interested in the correct approach to the architectural market.

been prophesied as a national goal. Roughly half of this sum represents materials, and half labor. In a carefully conducted survey by an independent statistical organization, it was found just prior to the war that 71½% of the national dollar spent for building was architect-controlled. Certainly, a group with this much folding money at its command is worth cultivating.

Not all architects are equal in ability, personality, love for building material salesmen, or in purchasing potency. There are young ones and old ones, friendly and unpleasant ones, very proper ones and others addicted to gin, girls, and glee clubs. But any way you slice him, the architect is still the only professional man qualified by training and experience to coordinate a building operation as required by the special designs for a specific problem for a given client.

The architectural profession consists of a group of only about eight thousand offices. These eight thousand represent enormous purchasing power. They are not *sold* in its commonly accepted sense of the word. Rather, the most successful building product manufacturer arranges his relations with the architect so that the architect may most easily exercise his function of *buying*. There are five, and only five, basic principles involved in allowing the architect to specify the products that will transform his design into a building.

Five basic principles

First, it is necessary for a building product representative to call on the right man in the architect's office. That may be the designer, an engineer, specification writer, the superintendent, or the office manager. There is even an authenticated case of an office boy who did a salesman for electric lighting fixtures out of a $75,000 contract because the salesman was—shall we say, "undiplomatic." In a small office the architect will perform all functions himself. In a larger office there will be many men.

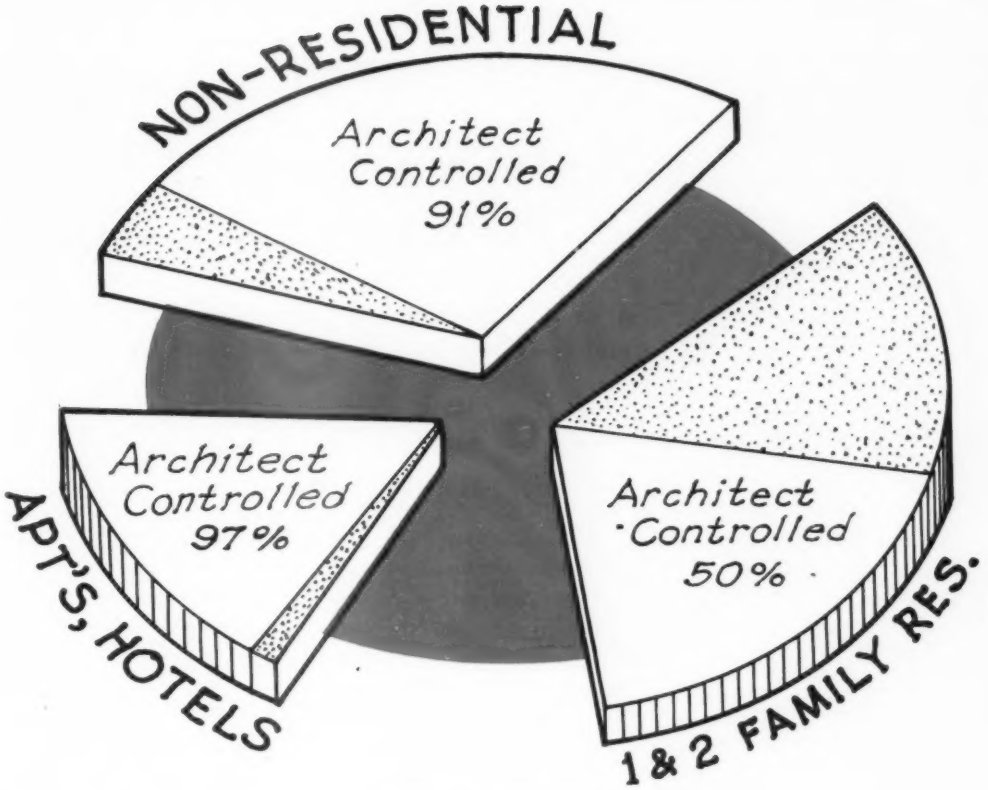
In the heyday of the 1920's, one survey showed that the average architectural organization consisted of 4.6 individuals. There has been a suspicion on the part of some old-time building product representatives on leaving an architectural office, that he had called on the six-tenths of an individual! But plus or minus personalities can not enter into any phase of selling, so the occasionally difficult call must be regarded as nothing more than a challenge . . .

However, the architect, considering the multiplicity of his duties, is not altogether a reprehensible character! It should be remembered that the American Institute of Architects filing guide lists forty-one categories of a construction operation. Into these categories fall 1,169 classes of products made by 4,000 separate manufacturers with national distribution. The architect's work runs the gamut of everything between the "preparation of the site" to "sculptural models." In the good old days he received, daily, seventy printed pages of direct mail literature which he was supposed to read; he received countless novelties in the form of ash trays, samples, and sometimes a bottle of Scotch; his catalog file was only deemed complete by one authority in the field if it contained 100 linear feet of filing space! The time consumed to receive the personal sales calls of manufacturers representatives made his day complete. The busy architect would have had very little time for architecture had he been easily beguiled into reading all his mail and receiving all his callers.

The New York Chapter of the A.I.A. says "The architect will consider his staff as an extension of his professional capacities, with the responsibilities and the perogatives commensurate therewith." Any man in the picture may be the one who will make the choice between porcelain enamel and some other product.

Don't underestimate the "draftsman"

Therefore, the architect has what are known in England as "assistants," and in this country as "draftsmen." The term draftsmen is often used disparagingly, which is a mistake. Outside of the profession, the word is usually applied to all the staff of an architectural organization with the exception of the men whose names are on the door. In another important survey conducted by an impartial research organization, architects said that their "draftsmen" influenced the selection, or actually selected, the building products used. Many of these so-called draftsmen are registered as architects, they have degrees from leading architectural colleges, they may have a private practice in their own right in their free time. Tomorrow any draftsman may



THE NATIONAL BUILDING DOLLAR

The dollar is cut up into three basic slices as shown in the above diagram. About one-fifth is spent on apartments and hotels, about two-fifths on non-residential buildings, and the remaining two-fifths on single and two-family houses. The architect is an important factor in deciding what materials are used, and represents a compact, receptive market for porcelain enamel.

open an office of his own and have *his* name on the door.

Architectural practice is a collective pooling of skill and talent in any but the one-man office. The architect is the coordinator and the integrater of these. A building product salesman likes to report to the sales manager that he had an interview with "the architect himself." However, the duty of making the actual decision on the product to be used may have been delegated to one of the draftsmen.

Call on the man who is going to decide, regardless of his title or position in the architect's organization.

The *second* important axiom for the building material salesman is to call at the right time. Missionary calls are rarely sales calls. They may pave the way, and occasionally they might even, by the law of chance, be opportune. The first step in the design of a building is the selection of the *type* of materials—e.g. wood, brick, stone, metal, porcelain enamel, plaster, etc. The sales problem becomes infinitely more difficult if the salesman has to try to change a decision from the generic class of materials. If it is merely a matter of selling his product in competition with another of the same kind he will find it relatively easy. The conclusion is that the most profitable sales calls are made at the very beginning of a job when the designer's mind is open to a class of products rather than to a specific brand of product. It must be remembered that the sale of building products is a heavy industry and is not like a door-to-door magazine subscription business.

The *third* rule is to "know your product." The need for the product that you sell exists. It is not like selling cures for bad breath, constipation, or unruly hair—where the buyer must first be convinced of the need. Proof of this basic difference in the existence of a need for a product is shown by the fact that the building products industry spends only ½ to 1% of their gross in advertising, whereas the drug industry spends 8%. The assumption, therefore, would be that the architect is anxious to know of the facts or product which satisfy the requirements of the building he is designing.

The architect specifies results not methods

Confucious said that a building does not consist of walls, floor, and ceiling, but of the spaces enclosed by them. In the same way, the architect specifies *results*, not methods. The architect does not specify hinges for doors—he specifies the "openability" of the door. He does not specify roofing, he specifies the function of a material which will keep rain out of the building. He does not specify glass for its own sake, but rather the ability of glass to keep out the elements and yet permit vision. He is not trying to assemble products into a building—he is trying to create an enclosed space that will function.

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Porcelain enamel plays a part
in synthetic rubber production

brief story of one of the little heralded but important industrial services of special porcelain enamel coatings

By J. D. Wilkerson • SECTION HEAD, CHEMICAL ENGINEERING DIVISION, GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO

CHEMICAL engineers of Goodyear Tire & Rubber Company have given porcelain enamel coatings a rather wide and versatile usage in their chemical manufacturing and synthetic rubber processes.

The synthetic rubber operation at the present time is the greatest user of this equipment, but the product "Pliofilm," manufactured by Goodyear, is fast becoming a big user of porcelain enamel for its processing.

Porcelain enameled reactors, piping, valves and fittings are standard equipment for polymerization work in the manufacture of synthetic rubber. Enameled coatings have been found to be far superior to other corrosion-resistant materials.

Although the primary advantages of porcelain enamel coatings are ease of cleaning and freedom from product contamination, corrosion re-

Checking venturi valves on latex line which has been porcelain enamel lined for corrosion resistance.

Adjusting valve at the bottom of the porcelain enamel lined synthetic latex polymerizer.

sistance is highly important. In all instances, the linings have given satisfactory service for latex preparation, at pH from 5 to 10, at temperatures up to 140° F.

Polymerization of atoms

Goodyear research laboratories began working in the early 1920's in search of a synthetic which would equal or improve upon natural rubber. In the middle 1920's, one important step was discovered — the emulsification process by which atoms could be polymerized, closely resembling nature's own way of creating latex in the sap of the rubber trees. Research continued, and, in 1937, Goodyear built its first "Chemigum" tire.

Each of the various types of synthetic rubber which came out of World War II found its level. Some grades were better for tires, others for industrial rubber products such as air, water, and suction hose, and still others for chemical goods such as flooring, wrapping materials and the like.

Goodyear engineers, faced with the problems of huge war production schedules for synthetics, called on porcelain enamel coatings to cut down stoppages resulting from corroded or clogged vessels. Porcelain enamel did the job admirably well.

Enameled linings have also proved satisfactory for acid coagulating liquors containing up to two per cent sulfuric acid or hydrochloric acid with various concentrations of sodium chloride, various dilute alum solutions, and acetic acid at temperatures up to 175° F. Here again, ease of cleaning as well as corrosion resistance is an important factor.

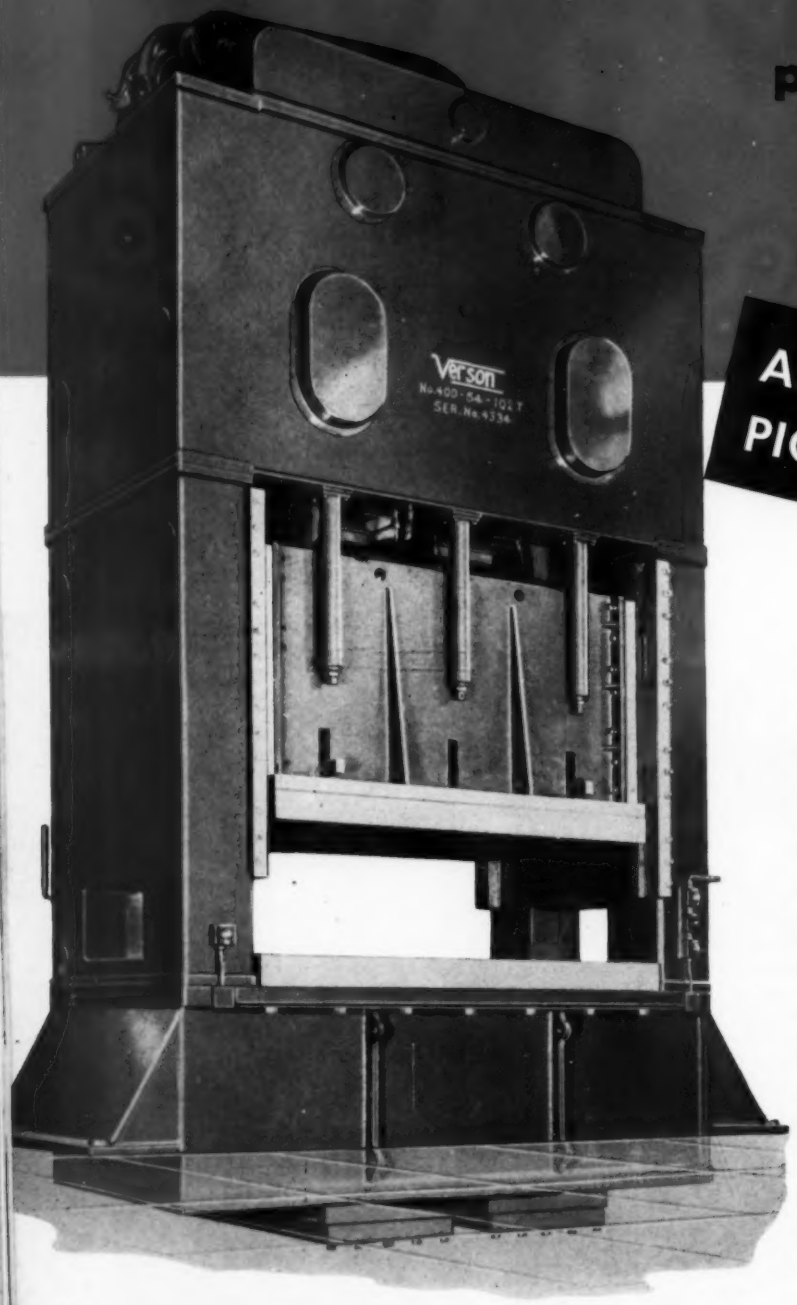
Porcelain enamel coatings have been used extensively to protect equipment used in the reaction of dry chlorine gas with aromatic hydrocarbons at temperatures up to 330° F. Hydrogen chloride is evolved from this process and in such reactions, any metal or alloy, ferrous or nonferrous, presents an inhibiting or catalytic action detrimental to the properties of the reaction product. In such cases, porcelain enamel is a prerequisite.

Specialty uses

Goodyear chemical engineers have found many specialty uses for porcelain enameled equipment and auxiliaries in the chemicals and plastics manufacturing processes. One feature of equipment so coated is its ready adaptability to many varied corrosive processes without danger of excessive corrosion as is often encountered when using corrosion-resistant alloys.

After more than 25 years

there is no press construction that equals the Allsteel Welded Frame



AS ORIGINATED AND PIONEERED BY Verson

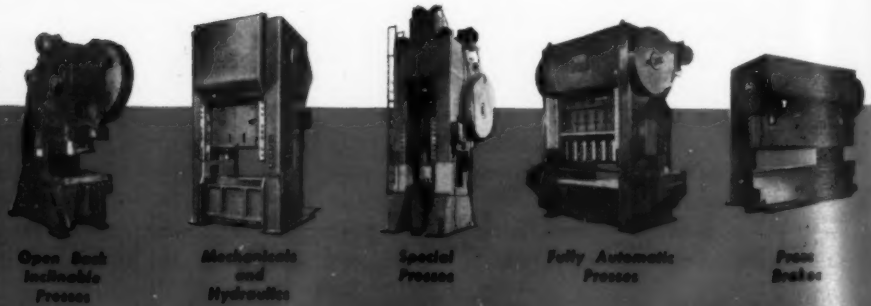
When Dave and John Verson introduced the allsteel welded press frame over 25 years ago the art of press-working of metal took a giant stride forward. For many years, while others resisted this important innovation, the Versons built presses with welded steel frames. Proof-positive that their principle of welded steel press construction was sound is found today in the final acceptance and wide-spread use of this method of construction by others. And Verson, as the originators and pioneers of allsteel welded presses, still sets the standard toward which others build.

Today, Verson is utilizing its long experience in building better presses to lead in the development of fully automatic mass production equipment. Many products heretofore produced on several separate presses are now being made on a single, automatic Verson machine, thereby making possible greater production at lower unit cost.

Whatever your press problems, it will pay you to investigate what Verson can do for you.

VERSON ALLSTEEL PRESS CO.
9320 So. Kenwood Ave., Chicago, 19, Illinois

There is a Verson Press for every job . . . from 60 tons up!



Decorative processes for porcelain enamel

a review of the various decorative methods, including information regarding the colors used in each case

photos courtesy Enamel Products Co.

By H. C. Draker and R. F. Morrison • THE HARSHAW CHEMICAL COMPANY, CLEVELAND, OHIO

SEVERAL methods have been used as a means of decorating porcelain enamel surfaces. Some of the methods have been proven cumbersome and costly, and have to a large extent been replaced by more efficient processes. However, the choice of any method is controlled by the specific requirements of the problem. Hence, it is entirely possible that a discarded process might be revived to fulfill a special need.

In this article the various methods will be briefly reviewed and information included regarding the colors used in each case.

General requirements for ceramic color oxides

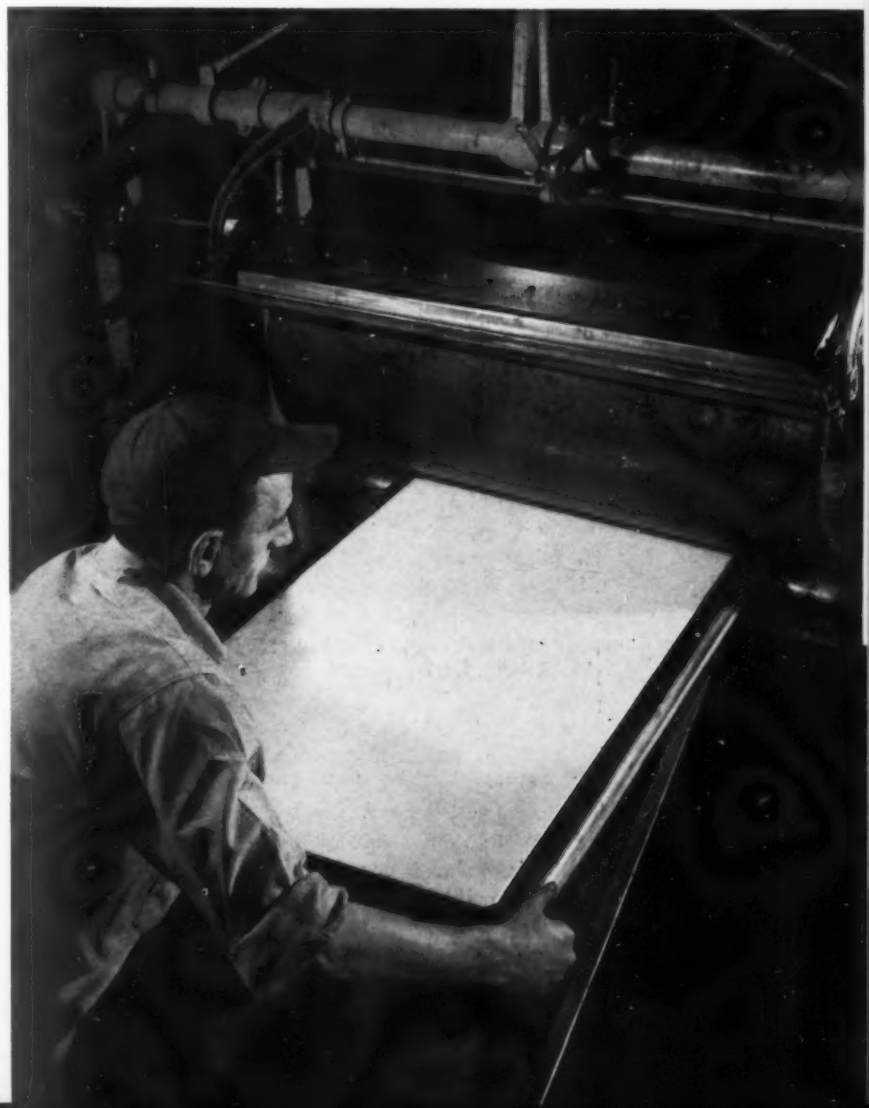
The general requirements for color oxides to be used in any decorative process are very similar. They must be finely ground within narrow limits in order to produce a uniform color free from a mottling effect that would be caused by the presence of any coarse particles. This finely divided condition is also very essential for all colors in order to permit an even distribution throughout the interstices of the milled frit.

The oxide composition is developed primarily from experience and must consist not only of the color producing ingredients but also of materials which will produce a satisfactory state of refractoriness. This oxide property is very important and must be such that firing of the enamel coating is only slightly disturbed and yet not permit solution of the oxide in the fused enamel. Basically the important colors are made from a choice of materials containing the following metallic elements:

Black	Cobalt, Chromium, Iron, Copper
Brown	Iron, Chromium, Zinc, Aluminum, Silica
Red	Cadmium, Selenium
Green	Chromium, Cobalt
Yellow	Cadmium, Antimony, Lead, Tin, Vanadium
Blue	Cobalt, Chromium, Aluminum

The preparation of a ceramic oxide after a choice of a suitable composition usually consists of an intimate mixing of the raw materials, controlled firing, ball milling, screening, washing, drying, and a final pulverizing. Controlled firing is very important for the production of uniform colors. The fired oxide mass is in more or less of a sintered con-

Marblizing effect is applied by a mechanically operated embossed roll.



Decorating table tops by the screen process. With screen released, decorated top is removed from frame. This method offers wide latitude in design and decoration.

dition as it comes in saggers from the kiln. These sintered lumps are then ball milled to the desired fineness. With some oxides, diligent washing by agitation and decantation is necessary to remove any trace of soluble salts. The presence of such salts in the finished product might not only have a deleterious effect upon the color, but would be a source of trouble in the enamel.

Although most ceramic oxides are produced as just described, some may be made by the wet or precipitation method. Colors produced in this manner usually give excellent coverage. This characteristic is primarily due to the formation of particles in a very finely divided state. Moreover, if the precipitated mass is heated to expel volatile constituents, it becomes very fluffy and is more easily ground than sintered material.

The color developed by a given oxide will vary somewhat depending upon the frit with which it is used as well as upon the conditions under which the enamel is produced and processed. Frit constituents such as antimony, zinc, lead, tin, and titanium may influence the shade produced by a particular oxide. Conditions of milling and firing are important from the processing viewpoint in their effect upon color. Consideration is given to these factors during the matching of a color. After the color has been put into production, all conditions should be held as closely as possible to those existing when the final match was made.

The use of ceramic color oxides for decorating purposes is divided into two general classifications. The first is the conventional practice of adding an oxide to the mill batch to produce a desired color in the fired enamel. The second group may be considered as including various procedures which utilize the oxide in a specially prepared form which is applied to either fired or unfired coating of enamel.

Colored enamels

Colored enamelware has gone through several stages of popularity. Most of the time a portion of the kitchenware industry production uses a colored body with a contrasting color for trim. A solid color with or without graining is used extensively on heaters and table tops. On larger items most of the production is in white with some color being used as trim.

Speckling and stippling

Dark enamels commonly furnish the basis of producing speckled or stippled ware. The usual procedure in the case of speckled ware is to apply colored specks to the wet surface of a different color which has just been applied by either dipping or spraying. The specking may be done by revolving a roller brush with enamel on the bristles under a scraper or spattering the enamel on the surface using a stippling gun. This finish finds usage on various kitchenware items, oven liners and burner shields.

Polytone finish

The polytone finish has been used to a considerable extent upon flatware such as architectural shapes. The effect is accomplished by dry spraying rather coarsely milled enamel which produces a roughened surface. When this surface is dry, finely milled enamel of another color is sprayed onto the surface from the end of the ware at an angle. By applying one or more enamels in this manner only one side of the particles of the roughened enamel are coated thereby producing a multicolor effect with high lights in the fired ware.

Signs

The manufacture of signs consumes a large amount of colored enamels.

As has been described in detail in the literature this process consists in developing a design by the application of different colors and the experienced use of the stencil. Usually stencils which may be made from paper, zinc, or plastic are planned so as to leave the largest amount of a coating and reduce the amount of dry enamel that must be removed by brushing. As each succeeding coating of colored enamel is applied, the stencils are so designed that the unbrushed portion in each case contributes a step towards the ultimate completion of the final pattern.

The dried enamel in sign work must at all times provide a rugged surface to withstand brushing and handling. To strengthen the coating sufficiently to avoid breaking, small amounts of gum arabic in solution, are added to the enamel. Such additions are kept at a minimum as larger amounts will cause blistering and may tend to cause some colors to go "off-shade." Inasmuch as each color may require a separate firing, oxides used for this purpose must possess good firing stability. This property naturally varies with different colors and sign manufacturers may assist when it is possible to plan the sequence in which the colors are used. Blacks, blues, greens and browns being more stable should be preferably used for first coatings with less stable colors such as reds and yellows being advantageously applied last.

Some use has been made of spraying through a stencil directly upon the surface of the ware. In doing this it is necessary to hold the stencil a short distance from the ware. This procedure causes a blurred or ragged edge and it is doubtful if the method would in most cases produce an acceptable design.

Processed colors

The second general method of decorating porcelain enamel by the use of the color oxides in a special form is employed in decal work, graining and marblizing, printing, and the screen process. The oxides used in these operations are quite similar to those used as mill additions. In all of these methods, a decorative effect is obtained by the application of a thin film of color usually to fired enamel surface. Since the design, in most cases, is placed upon a finished surface, it must fire readily to a smooth glossy surface, must not flux into the enamel surface, must possess good covering power with distinct outlines and be able to meet desired requirements as to acid and alkali resistance. To accomplish these features, it may be necessary to blend the oxide with fluxes which are similar to frit in composition or in some cases with refractory materials depending upon the particular requirement. This blend is then mixed with some type of oil which serves as a vehicle.

Decals

Decalcomanias or decals are designs which are purchased in desired form. They have been used more extensively in the pottery industry as a means of decorating than they have in porcelain enameling. The design is printed upon tissue paper by special processes in various colors which have been prepared by milling fluxes and oxides very finely. The blend used for decals may consist of from 10 to 20% of color oxide with 90 to 80% of flux. Varnish serves as a binder for the color and assists in transfer of the design from the lithographic stone to the paper. A separate transfer is needed for each color used.

In using a decal the fired surface which is to receive the design is covered with a varnish which is allowed to dry to a tacky consistency. The decal is then applied to the tacky surface and rolled smooth with a

The screen process is also used in the manufacture of signs where accuracy in reproduction is important. It is a high-speed method of producing intricate signs in quantity.

damp roll or sponge. The paper backing is next floated from the design by immersion in water. The ware is then dried at about 400° F. to brown the varnish, thereby driving off volatile constituents that might cause blistering and finally fired. Usually the decal composition is readily fusible and may require a lower temperature or faster chain speed to prevent fluxing in with the enamel surface.

Graining and marblizing

Graining and marblizing are decorative processes almost identical in procedure. Graining as the name implies is the reproduction of a wood grain whereas marblizing uses the design obtained from a slab of marble. The graining process has been used more widely and has been a popular method of decorating stove and heater parts, table tops, paneling and other miscellaneous ware. In either case the design may be formed on the roll or may be etched on a steel or copper plate.

The printing medium consists of finely ground oxide blended with flux or silica intimately mixed with an oil vehicle. With some frit and oxide combinations there is a tendency for the grain to become sunken upon firing. This factor as well as firing conditions must be considered in arriving at a satisfactory oxide-flux or refractory blend which will give a grain firing down smoothly upon the enamel surface but not becoming sunken. Motor oils are commonly used as the vehicle with possible additions of clove, fat, china wood oils and balsams. Individual preference in many cases dictates the choice of addition to be made. The oil mixture used should be such as to provide proper wetting of the oxide blend, give sufficient tackiness to the paste for satisfactory pick-up, give a distinct reproducton, have a low flash point, and be free from any tendency to gum the etching. Thorough mixing of the oxide and oil is accomplished by running mixture through a roller or paste mill.

When an embossed roll is used, the graining paste is rolled smoothly on a glass plate. The roll is then run over the plate picking up a film of paste. The design is transferred to either the fired or bisque surface of the ware by applying the roll to it. If an etched or engraved plate is used, the paste is spread uniformly over the surface by means of a sharp edged blade. A smooth surface roll picks the design from the plate and subsequently transfers it to the ware.

In plants operating upon shapes of standard size, graining machines serve as a rapid and convenient means of applying this type of decoration. The roll of this machine is embossed and mechanically operated. It is inked by the paste passing over several feeder rolls with the final one transferring a uniform coating of paste to the embossed surface. For reproduction, ware is passed between the printing roll and another roll, directly below, which provides uniform pressure against the printing roll.

With the marblized plate, various designs may be obtained by using different colored pastes and superimposing one colored grain upon another.

Printing

Although the screen process has replaced many applications in which

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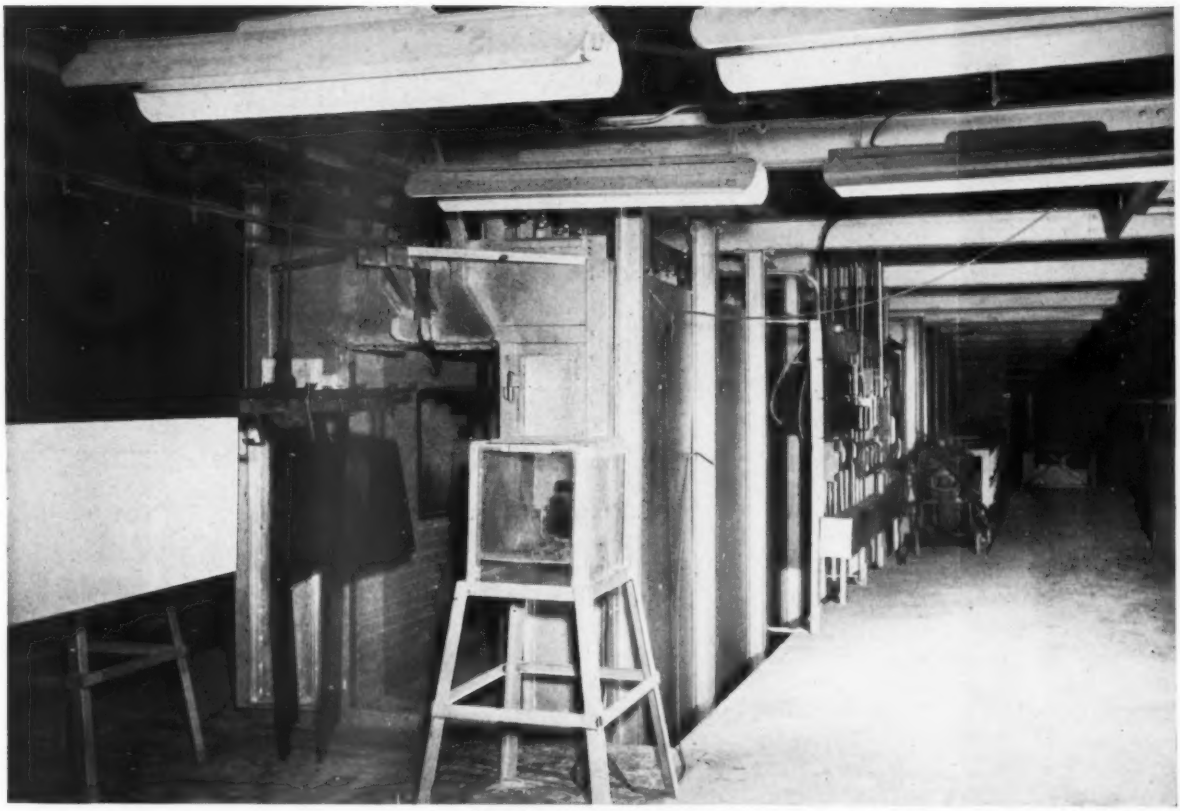
Edges are brushed to obtain contrasting trim on table tops. Color enamel has been applied along edges and fired. Dried cover coat is being brushed to give an even border. This same operation can be used in making borders on flanged signs.



Boland continuous furnace in the plant of The Warren Company, Inc., Atlanta, Georgia.

This new BOLAND "Single Flow" Furnace fires twelve foot long parts

Fire twelve foot long parts on a continuous furnace? Yes, it's being done with excellent results, and the furnace on which the parts are being fired is a BOLAND "Single Flow" Continuous.

Wide radius conveyor turns are a standard feature of all BOLAND straight-away continuous furnaces. They are better for any type of ware, for they permit closer loading and prevent costly conveyor wrecks. But, for twelve foot long fabricated sections, wide turns are a must. By combining this important feature with especially designed burning tools, this seemingly difficult job is being done, and done well.

Combine this feature with the BOLAND patented "Floating Roof" for long repair-free service — a pre-heat zone which raises temperatures gradually — the "Single Flow" firing zone for even heating of both sides of the ware — and then you will understand why more and more experienced enamelers are buying BOLAND built furnaces.

ALBERT J. BOLAND COMPANY

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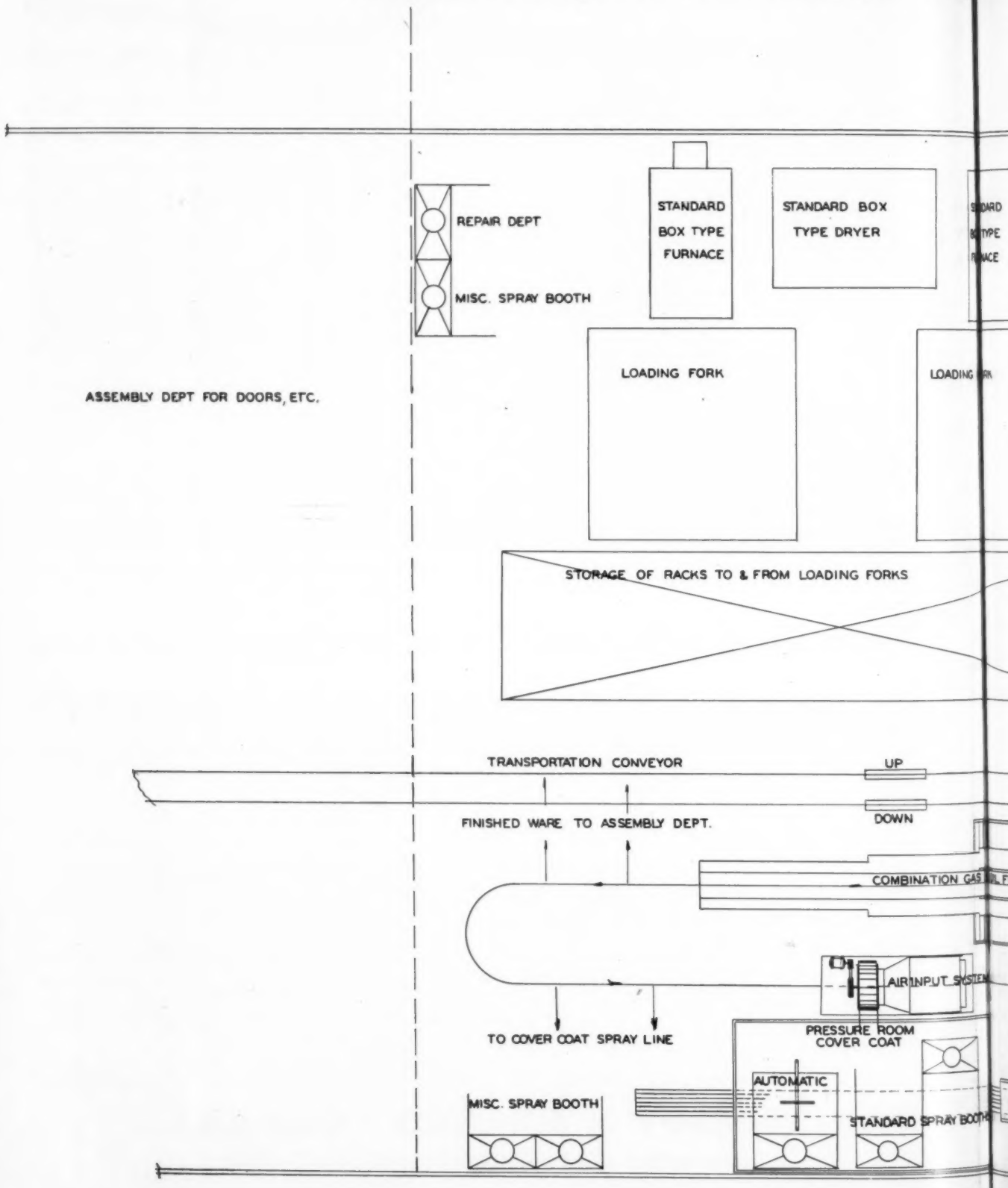
Designers and Builders of Continuous and Box Type Enameling Furnaces

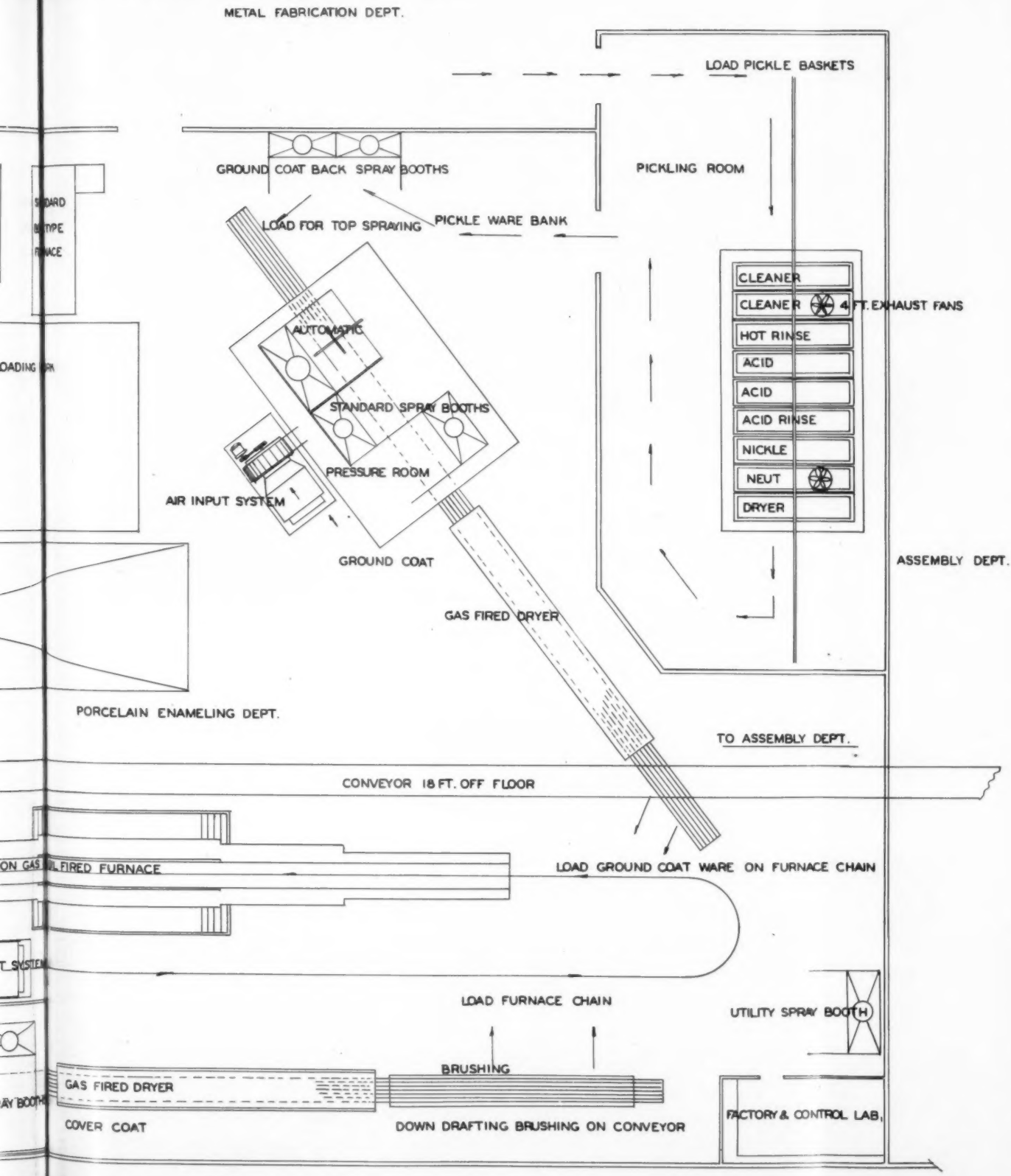
Plant layout No. 11.....

A continuous furnace enameling plant for con



(Plant description

t for commercial refrigerator parts



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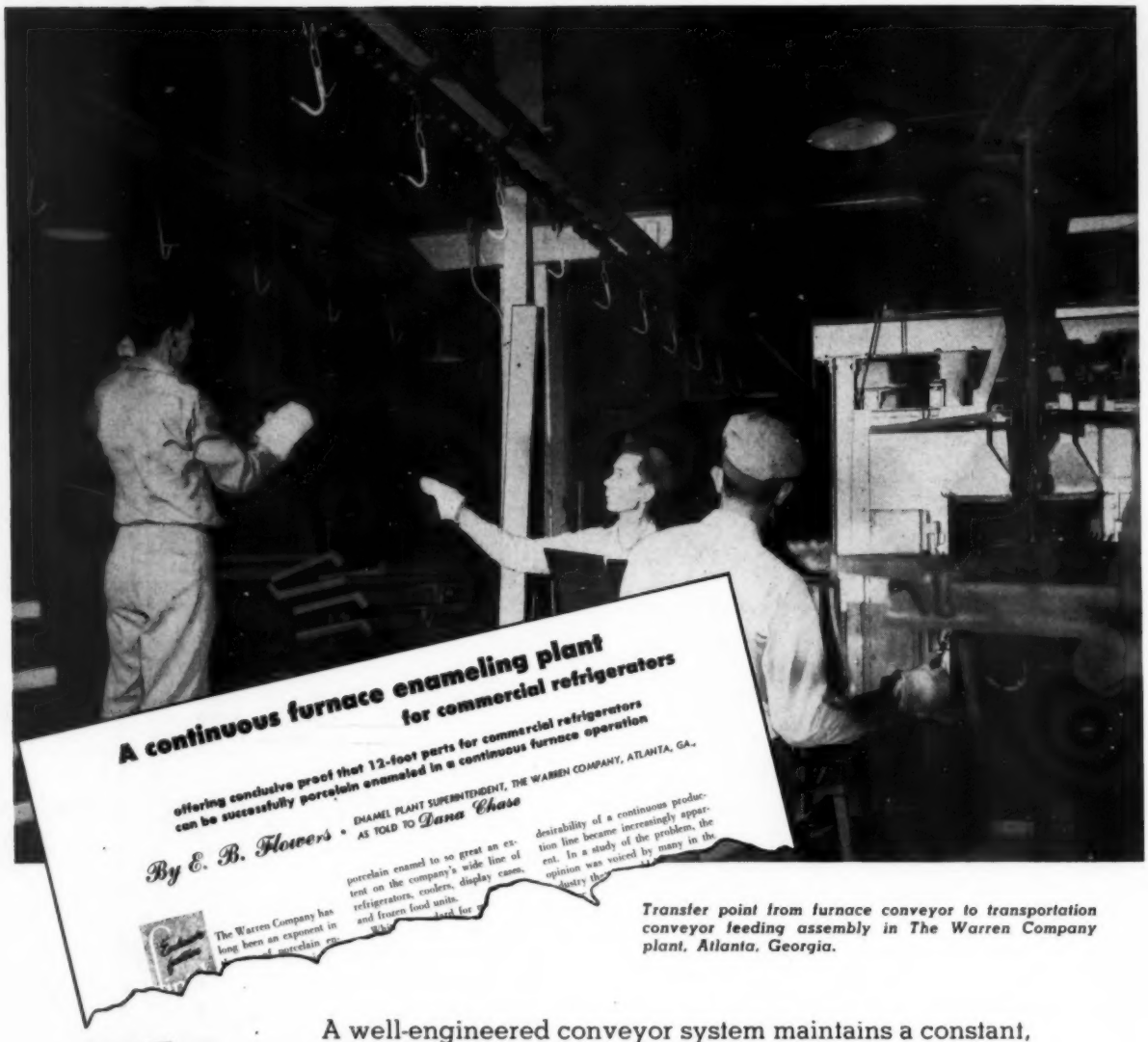
DRAWING BY MERSE M. MURPHY CO., CHATTANOOGA, TENN.


A continuous furnace enameling plant
for commercial refrigerators
offering conclusive proof that 12-foot parts for commercial refrigerators can be successfully porcelain enameled in a continuous furnace operation
By E. B. Flowers • ENAMEL PLANT SUPERINTENDENT, THE WARREN COMPANY, ATLANTA, GA.
AS TOLD TO Dana Chase
The Warren Company has long been an exponent in
porcelain enamel to so great an extent on the company's wide line of refrigerators, coolers, display cases, and frozen food units.
desirability of a continuous production line became increasingly apparent. In a study of the problem, the opinion was voiced by many in the

Transfer point from furnace conveyor to transportation conveyor feeding assembly in The Warren Company plant, Atlanta, Georgia.

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OFFICES IN PRINCIPAL CITIES

Left: GAMA'S Managing Director Whitelaw and President Robertshaw with AGA'S President Reed. Right: Jean Thompson, AGA'S Lady of The Press, with J. M. Moffat, representing Moffat's Limited of Canada.

GAMA holds 13th annual meeting

THE Gas Appliance Manufacturers Association held its thirteenth annual meeting at the Drake Hotel, Chicago, on April 5, 6 and 7.

The program committee consisted of W. H. Rudolph, chairman, Savory Equipment, Inc.; John C. Pankow, Detroit-Michigan Stove Company; Richard H. Hinckley, General Water Heater Corporation; M. L. Lavorgna, Richmond Radiator Company; Robert J. Canniff, Servel, Inc., and J. F. Donnelly, A. O. Smith Corporation.

On Monday, April 5, there were meetings of the Marketing Committee, Board of Directors, and the Marketing Committee's Sub-Committee on Direct Heating Equipment. The Board Dinner was held Monday evening.

General sessions were scheduled for Tuesday morning and Wednesday morning, with John A. Robertshaw, GAMA president and president of Robertshaw-Fulton Controls Company, presiding.

Robertshaw opened Tuesday's general session and was followed by a report of the treasurer, John Van Norden, secretary of American Meter Company, and a report of the General Nominating Committee headed by Lyle C. Harvey, president of Bryant Heater Company.

Newly elected officers and committee chairmen are:

President: Frank J. Nugent, Bryant Heater Company

1st Vice President: S. H. Hobson, Geo. D. Roper Corp.

2nd Vice President: Frederic O. Hess, Selas Corporation of America

Treasurer: John Van Norden, American Meter Company

"CP" Manufacturers Group

Chairman: A. B. Ritzenthaler, The Tappan Stove Company

Vice Chairman: H. E. Jalass, Cribben & Sexton Company

Domestic Gas Range Division

Chairman: W. Frank Roberts, Standard Gas Equipment Corp.

Gas Clothes Dryer Division

Chairman: L. F. Worth, Bendix Home Appliances, Inc.

The new officers will take office as of October 1, 1948.

Following election of officers came

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finishfotos

Left: H. E. Jalass, Cribben and Sexton; Julius Klein, Caloric Stove Corp.; John West of AGA; and American Stove's Marc Pender and Tracy Madole. Right: These men take office October 1: President, Frank Nugent; First Vice President, Stanley Hobson; Second Vice President, Frederic Hess; and re-elected Treasurer, John Van Norden.

How we answered the problem

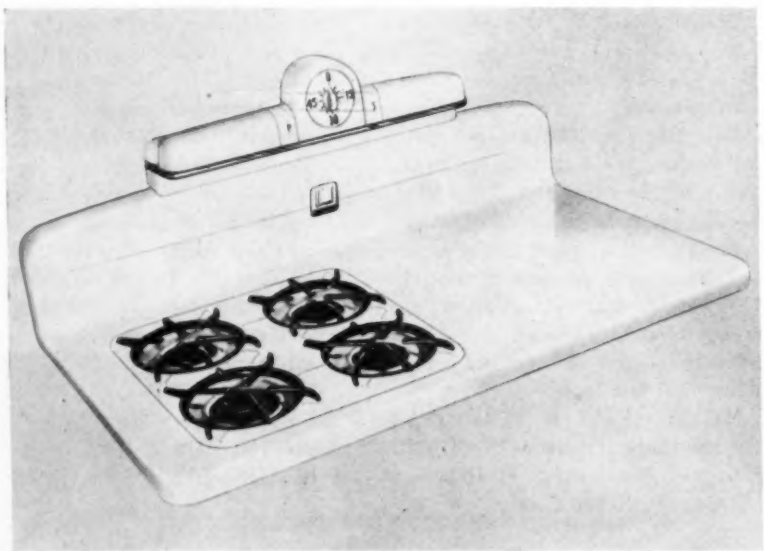
of all-white gas range tops

using titanium enamel over ground coat on titanium steel

By B. A. Gillette

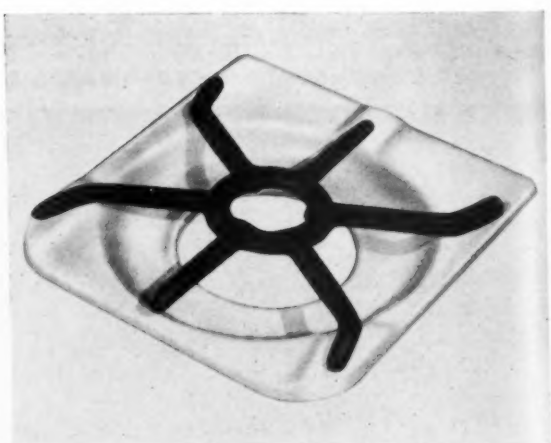
• SUPERINTENDENT, PORCELAIN ENAMELING DIVISION, CRIBBEN & SEXTON COMPANY, CHICAGO, ILL.

A PROGRESS REPORT



Above: This photo shows the type of Thriftop, on which the early experimental work was done, mounted in the stove top used on Universal ranges at that time.

Right: Photograph of the latest unit designed for current production. Notice reduced sharpness of radii on embossed sections and also that bowl around the burner has been depressed to prevent flame impingement.



Exclusive feature finish

Until 1945, Cribben & Sexton Company did not have an all-white top on its line of Universal gas ranges. The main top was white, but the Thriftop (the insert section immediately surrounding the burners) was black. In January of 1945, however, the sales department asked for a white Thriftop. The request was passed on to the enamel shop where a development program was immediately initiated. Test samples were enameled and submitted to the engineering department for breakdown tests.

The first samples submitted were of both cold rolled and regular enameling iron. The enamel finish consisted of high-fired ground coat, burned at 1600° F. for five minutes, and a zirconium cover coat fired at 1560° F. for four minutes, topped with a light coat of antimony acid

Pickle Room Cycle
(For white cover coat direct to steel)

	Type	Temperature	Time	Concentration	Remarks
Cleaner	Alkaline	212°	20 min.	8 oz./gal.	Use new type synthetic detergent when applying ground coat
Rinse	———	Cold	Slush 3 Times	———	Good rinse is helpful
*Acid	Sulphuric	160°-170°	*8 min.	8%	Previous cycle called for 10 min.
Rinse	———	Cold	Slush 3 Times	———	
*Nickel	Single Nickel Salts	150°-160°	*15 min.	2 oz./gal. pH 3-4	Previous cycle was 7 min.
*Rinse	*None used				Rinse omitted to help eliminate slight copper-heading due to oxidation
Neutralizer	Soda Ash Borax Cyanide	160°	3 min.	.25 Na_2O	Good neutralizing is necessary

*Indicates change from regular setup.

resisting enamel. *(These firing temperatures are only comparative.)*

Numerous washboiler tests, impact tests and thermal shock tests, including the intentional boiling over of foods such as oatmeal, were used to break down the enamel finish. Tests for thermal shock showed unfavorable results from the standpoint of crazing and spalling. Crazing showed up first on small embosses around each bowl as well as in the very center of the Thriftop directly above the top burner pilot.

Lighter application weights improved results

As would be expected, the lighter the total application of enamel, the better the samples stood the tests. A number of different frits were used experimentally in producing the enamels for these first samples, and the results compared.

It was at this time that we first heard of titanium-bearing killed steel. Due to the fact that this steel was reported to eliminate the necessity of applying ground coat, we ran tests using the special steel and zirconium type cover coat direct on the metal. By this method we cut total enamel thickness from .018 to .0145. (The .0145 thickness included the standard cover coat plus acid resisting enamel.)

Before we submitted samples of this type, however, considerable work was required in the enamel shop laboratory setting up the proper procedures to follow. For example, we found the press room had to be more careful when handling this steel, so that there would not be any surface defects that we couldn't cover. We also had to work up a slightly different pickle room cycle. *(See table.)*

Too much nickel was disastrous

We found that even though considerably more nickel flash was required for a good bond, too much was disastrous from this standpoint. We found the best range of nickel deposition was from .06 to .075 grams per square foot.

After setting up the revised pickle room procedures, we again submitted samples for test and the results showed a decided improvement over previous samples. Crazing and spalling still was apparent after hours of continued punishment, but part of this we realized was due to the design of the part. This has been corrected in our 1948 design. The results, however, were satisfactory to the point that after receiving a sufficient allotment of titanium steel, Universal ranges started flowing into the customers' homes with an all white top.

Field checks conducted

Each range having one of these all-white tops was followed up very closely by the sales and service department, so that we might gather data from actual field tests. The data obtained helped us to improve our enameling technique as well as make sure we had a satisfied customer. A close record was also kept of the rejects in the enamel shop, and we found that the rejects were 50% less on Thriftops that they were on other somewhat similar pieces.

Titanium enamel experiments

In the summer of 1946 our enamel shop laboratory started working with titanium enamel. By the fall of '46 it was thought advisable to start using this new highly acid resisting enamel on the main tops, and, since the Thriftop formed a part of the main top assembly, we had a definite color problem. The titanium enamel applied directly on the steel produced a different color than when applied over a ground coat on the standard enameling steel of the main top.

We continued working on the color problem in our enamel shop laboratory but, due to production schedules we had to meet, we started applying a ground coat to the titanium steel Thriftop with a cover coat of titanium enamel. This gave us the color match we were after.

Samples of this type were submitted to engineering for test, and it was found that these samples stood up slightly better than with the previous method of applying a zirconium enamel cover coat directly on the steel plus an acid resisting coat. This was, no doubt, partly true due to a still greater reduction in overall enamel thickness (.0145 – .0095).

Thriftops run for test samples only (unsatisfactory for color matching), with a .006 to .007 application of titanium enamel directly on the titanium steel, seem to have good thermal shock and impact resistance. These tests are being continued in the laboratory, however, for further clarification.

A more extensive production use of the titanium cover coat direct on titanium steel is limited by present material shortages. The development work with these materials has, however, given us an answer to a difficult problem—the production of all-white tops for gas ranges.

We do not feel that this development need stop with the Thriftop.

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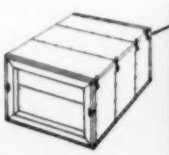

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Left: John Ashbaugh and C. H. Guy, of Westinghouse Electric, with John T. Urban, Westinghouse Supply. Right: Howard J. Scaife and L. I. Sweetland, of Hotpoint, and C. J. Fuhrmann, Dayton Power & Lgt.

Edison Electric Institute

fourteenth annual sales conference

AT THE opening of Edison Electric Institute's 14th annual sales conference, held at the Edgewater Beach Hotel, Chicago, April 6-8, Ralph P. Wagner, chairman of the EEI commercial division general committee, emphasized the need for well organized and trained sales staffs.

Wagner predicted that "year-end sales will soon depend for annual increases more upon our aggressive well-organized sales staffs, and intensive advertising and promotional programs, than upon the naturally increased demands of our customers."

Skit on salesmen

A special skit highlighting the position of salesmen was presented under the title "The Defense Rests." A sales manager was accused of failure to perform his duties to the best of his ability. He was acquitted, however, on his promise to go all-out on programs sponsored by the EEI, NEMA and others.

Hughes electric cooking awards

The Philadelphia Electric Company received the first prize trophy in Class I of the George A. Hughes Awards for its outstanding achievements in the promotion of all-electric kitchens during 1947.

In Class II, Florida Power Corporation, St. Petersburg, and its affiliate, Georgia Power & Light Co., Valdosta, Ga., took first prize for the most successful promotion of domestic electric ranges.

In Class III, Wisconsin Electric Power Co., Milwaukee, received first prize for its achievements in promotion of commercial electric cooking.

PHOTOS COURTESY FAIRCHILD PUBLICATIONS

Curtis commercial lighting award

Noman Tindal, a commercial lighting representative of Duke Power Co., Charlotte, N. C., received first prize in the August D. Curtis Award, for the outstanding commercial lighting installation during 1947. Tindal's award consisted of a certificate and a $200 cash prize.

Offered by Curtis Lighting, Inc., Chicago, in memory of its founder,

to Page 61 →

Left: H. F. Lehman, Frigidaire; Geo. C. Whitwell, Philadelphia Electric; P. M. Bratten, Frigidaire; D. E. Stultz, Potomac Edison; Lee Clark, Frigidaire. Right: H. J. Wilson, Georgia Power Co.; John Fellmann, Deepfreeze; Rose White, American Central; R. V. Neubell, Deepfreeze.

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Manufactured by
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INGRAM-RICHARDSON MFG. CO., OF INDIANA, INC.
OFFICES, LABORATORY AND PLANT,
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"Best buy's Porcelfrit"

The Washington round-up

By Wilfrid Redmond

THE Department of Commerce started in January to put into effect a program of voluntary allocation of steel under the authority of the Taft Anti-Inflation Act. Three months later not a pound of steel has been allocated under the program. In fact, no agreement has been reached for such allocation.

Even consumers of steel, who were able to work out an allocation program for freight car production with the steel producers upon recommendations of Congress and the Office of Defense Transportation, have refused to go along with the plan proposed by the Department of Commerce which took it over from ODT.

Explanation of the Department of Commerce for the delay in getting voluntary allocations of steel started is that it takes time to get such an undertaking organized.

However, if the situation suddenly demanded it the Office of Industrial Cooperation of the Department of Commerce has an organization that could rapidly put into effect mandatory controls over steel and other scarce commodities. And with the ERP and military programs about to draw upon U. S. production for steel, aluminum, and other materials, such controls may not be many months away. If this were not an election year, standby controls would probably have been enacted by now.

President Truman said at a recent press conference that he had several times asked for controls to mobilize our industrial forces in an emergency but that all he had got was an innocuous program that the Administration was trying to make work. This statement is interpreted as preliminary to another trip to the Hill to ask for authority to control distribution and prices.

The President's Council of Economic Advisors, in another quarterly report, has recommended standby controls. The urgency now is greater than before, the Council reported. First reaction of the Congress to this new buildup for mandatory controls was a statement by Senator Taft that standby controls are not necessary, that if we need such authority it can be approved by the Congress when it is needed.

The Department of Commerce recently announced a meeting of steel warehouses and jobbers in Washington to consider the formation of an advisory committee to work out a program for more equitable distribution of steel products by warehouses. The announcement emphasized that this program would not be aimed at getting more steel for the warehouses but at breaking bottlenecks in present warehouse distribution.

Four shortage categories

This program is intended to improve distribution of steel to small business. The warehouses will be asked to co-operate in supplying steel to firms that are serving the major shortage areas. The Department of Commerce announced at the beginning of the steel program that these four shortage categories were housing, freight cars, petroleum equipment, and farm equipment. The farm equipment producers, called in to form a committee, approved a resolution saying they did not want a voluntary allocation program for their industry.

The small producers of farm equipment did not all agree with this position, however, and complained to the Senate Small Business Committee and to the Department of Commerce that the big producers were not speaking for them. So the Department of Commerce will try to get the warehouses to give the small manufacturers in the shortage areas a better deal.

It is difficult to see what the Department of Commerce expects to accomplish with such a program. The warehouses already are rationing steel to their established customers and many of them are getting one-tenth of the steel these customers have ordered. Some of them are not serving new customers at all.

This is the best the Department of Commerce has come up with so far to assist small business. Yet all the complaints to the small business committees of the Senate and House and to the Department of Commerce are from small manufacturers. Four railroads refused to go along with the Department of Commerce program to allocate steel for freight cars because they were afraid they would be asked to give up their historical suppliers and get their steel from producers they had not dealt with before.

Reaction to voluntary allocation programs

The first adverse reaction to the voluntary allocation program was when the farm equipment industry said they did not want to have anything to do with it unless they were unable to get as much as steel as they got last year. The next reaction came from the petroleum industry which sent in a bill of requirements for eight million tons of steel in 1948. The largest quantity this industry used in any previous year was 3.1 million tons. The amount estimated for 1948 for petroleum equipment is more than the Department of Commerce planned to ask the steel industry to allocate on a voluntary basis to all four shortage areas. Secretary Harriman estimated at the start of the program that the quantity of steel products to be allocated would not be more than ten per cent of output or about 6.6 million tons.

The Department of Commerce recently began to set up a program in the area of building materials and called in producers of soil pipe and pressure pipe. These are considered to be the two most urgent shortage areas in the building material category. These two groups of producers agreed to form committees, present a bill of materials, and meet with a Pig Iron Advisory Committee, previously named, to see what can be done about channeling more pig iron

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7 features for your enamels with M&T SODIUM ANTIMONATE

- true white color
- high degree of opacity
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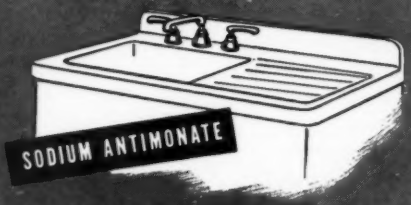

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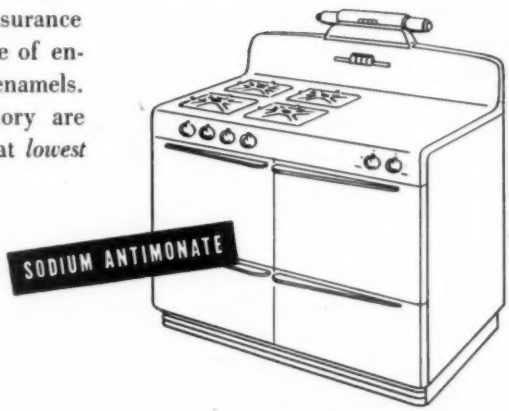
Exacting methods of manufacture—plus the most modern processing equipment—are your assurance of a uniform, high quality opacifier capable of enhancing both the beauty and durability of enamels.

The facilities of our Ceramics Laboratory are available to help you get the *best* results—at *lowest possible* cost.



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NEWS

1948 PEI forum at U. of I. on October 13, 14 and 15

The 10th annual forum of the Porcelain Enamel Institute will be held at the University of Illinois, Urbana, October 13, 14 and 15, it has been announced. The date and place of the forum were determined at a meeting of the organization's executive committee, held March 11 at the William Penn Hotel, Pittsburgh, Pa.

Pennsylvania Salt Manufacturing Company has announced the appointment of Charles R. Sorber, Jr., of Philadelphia, as district sales representative in St. Louis, Mo., for Pennsalt's special chemicals division. Sorber's territory will include all of Missouri and the southern section of Illinois.

Prior to joining Pennsalt last September, he was a sales engineer with Proctor & Schwartz, Inc.

Murray home appliance division appoints Morgan sales engineer

Hodge C. Morgan has been appointed senior sales engineer for the home appliance division of Murray Corporation of America ,in Scranton, Pa., it has been announced. As assistant to H. C. Beresford, division sales manager, he will be responsible for gas and electric range sales.

Morgan had been with the laundry equipment sales division of Frididaire where for the past two years he was assistant to the manager of sales. Previously, he was associated with Automatic Washer in production control and planning department, and with Maytag as regional manager.

Perfection advances Haag

William H. Haag has been appointed works manager of Perfection Stove Company, Cleveland, Ohio, according to an announcement by C. A. Blackburn, director of manufacturing and former works manager.

Haag joined Perfection in 1928, following his graduation from the University of Michigan. For several years he was production manager of the firm's Platt Avenue and Ivanhoe Road plants. He was promoted to assistant works manager in July, 1947.

Harbison-Walker official retires

W. B. Coullie, vice president and a director of Harbison-Walker Refractories Co., Pittsburgh, Pa., has retired after more than 40 years with the firm. He was appointed general sales manager in 1929, and in 1937 was elected a director of the company. He has been a vice president for the past seven years.

Electrical Merchandising editor dies

Finish regrets to report the death of Les Moffatt, well known to appliance manufacturers as editor of Electrical Merchandising. We will miss him at future meetings of the various appliance groups.

"Armco Steel Corporation"

The name of The American Rolling Mill Company was changed to "Armco Steel Corporation" at the annual meeting of company stockholders, April 15, according to an announcement by Charles R. Hook, president. The change became effective April 17, it was stated. *(See Page 45, March, 1948 finish.)*

Chicago enamelers participate in technical conference and production show

At the Chicago Production Show, held March 22-24 at the Stevens Hotel, the Chicago District Enamelers Club booth was a "must" stop for Show visitors.

The fascinating display included a continuous full color strip film portraying some of the inherent advantages of porcelain enamel as a finish material; a miniature Frigidaire cannon, which shoots ¾-inch steel balls at a porcelain enameled steel panel at a rate of 3,600 per hour, without damage to the panel; and the Taber Abraser which measures the resistance to rubbing abrasion of solid materials and coatings.

At a panel discussion on porcelain enamel, Edward Mackasek, guest speaker, presented a talk on "Porcelain Enamel Comes of Age, and Dana Chase presented a number of physical tests and demonstrations illustrating physical properties of porcelain enamel.

At the conclusion of his talk, Mr. Chase exhibited one of the most revo-

lutionary recent developments in the industry—a coil of "porcelain wallpaper." *(See "Porcelain Wallpaper Dramatizes the Versatility and Flexibility of Porcelain on Steel," March, 1948 finish.)*

B. T. Sweely was technical chairman of the Club's panel.

Attendance at the entire Show, held in conjunction with the Chicago Technical Conference, was 5,676, more than triple the attendance of last year, according to Gustav Egloff, president of the Chicago Technical Societies Council which sponsors the conference and show annually.

Mullins appointment

Earl W. Stansel has been appointed assistant to Frank M. Beauregard, vice president in charge of operations of Mullins Manufacturing Corp., Salem, Ohio. He has assumed operating direction of the firm's plants in Salem and Warren, Ohio.

He formerly was assistant plant manager of Frigidaire in Dayton; factory manager of General Motor's Aeroproducts division, Vandalia, O.; factory manager of Nash-Kelvinator, Lansing, Mich.; plant manager of Remington-Rand, Binghamton, N. Y., and works manager of LaPorte Corp., LaPorte, Ind.

Enamel Products advances Johnson

Word comes to *finish* that George Johnson, Jr., former secretary of Enamel Products Co., has been promoted to vice president.

Four appointments in G-E control divisions

Four major appointments in the control divisions of General Electric's Apparatus Department were announced by K. R. Van Tassel, manager of the divisions.

Van Tassel named M. H. Blesh, manager of manufacturing; C. B. Bradish, manager of engineering, and E. A. Green, manager of sales. Simultaneously, Guy S. Hyatt, comptroller, Apparatus Department, announced the appointment of Thomas I. Hage as accountant for the divisions.

Color trend in plumbing ware

One trend disclosed at the recent National Association of Home Builders show in Chicago, pointed out that although the greatest demand is for white plumbing fixtures, the plumbing industry is devoting a portion of its production to colored fixtures. The colors available are: light blue, light yellow, light green, pinks, brown, and deep red, said the Bureau report.

Sylvania Electric sales gain in 1947

Sales of Sylvania Electric Products, Inc. rose to $95,715,638 in 1947, the largest for any peace-time year in the history of the company, according to the annual report issued to company stockholders. This represented an increase of 38 per cent over 1946 sales, and compared with sales of $20,000,000 for 1941, the last pre-war year.

Texlite features porcelain enamel signs

In the picture, Ed Mackasek, left, managing director of the Porcelain Enamel Institute, is shown with Harold H. Wineburgh, president, Texlite, Inc., looking over one of the latest porcelain enamel product identification signs produced by the Dallas, Texas, firm for Mrs. Tucker's shortening.

The unusual sign is in a combination of colors blended to form the life-like image specified for the "shortening" sign.

Manufacture of heating equipment to begin at new Norge plant

The manufacture of heating equipment may start by the end of May in Hammond, Ind., in the newly acquired plant of the Norge Heat division of Borg-Warner Corp.,

according to C. S. Davis, Jr., vice president and general manager of the division. Meanwhile, the company will continue to make shipments of heating equipment from Kalamazoo, Mich.

Roberts & Mander sales training class

Nineteen members of the present sales training class at Roberts & Mander Corp., Hatboro, Pa., are shown in the above picture. The entire class of 21 students is composed 100 percent of ex-service men, according to Robert H. Hicks, corporation secretary and author of "Employee Training Gets the Spotlight at the Home of the 'Quality' Range" *(February, 1948 finish)*.

Pennsalt announces research and development appointments

Five new personnel appointments in the research and development department of Pennsylvania Salt Manufacturing Co., including that of J. Philip Evans as assistant to S. C. Ogburn, Jr., manager of research and development, were announced by the company.

The other new additions include Clifton R. Neumoyer, senior research chemist in research division; Harold L. Warner, associate patent attorney in patent division; Joseph Simkin, research chemist in special products division; and Charles A. P. von Hemert, junior chemical engineer in development division.

Howard Power, pioneer in washer industry, dies

Howard Power, a pioneer in the household washer industry, died in Davenport, Iowa, March 21, at the age of 74. He was for a long time secretary of White Lily Washing Machine Co. in Davenport, and later was secretary of National Household Devices Co.

He was one of the leaders in organizing the American Washing Machine Manufacturers' Association, known as the American Washer and Ironer Manufacturers' Association.

April meeting of ACS Trenton section

The April meeting of the Trenton Section of the American Ceramic Society was held at Jack Fowler's Restaurant, Friday, April 2, with 49 members attending, according to J. T. Smith, of the Section's publicity committee.

Chairman H. Magid opened a short business meeting and the minutes of the previous meeting were read and approved. Bickley Remmey, chairman of the Philadelphia Section, and R. R. Danielson, president of the New Jersey Ceramic Association, were then introduced.

John Elder, Section vice chairman, then introduced Harry Van Horn, of the Socony Vacuum Oil fellowship at Rutgers University, who spoke on "Organic Materials Used in Ceramic Manufacture."

Die casting firm reports top sales

Sales of Gerity-Michigan Corporation, Adrian, Mich., for March were nearly $1,400,000, highest monthly total in the company's history, James Gerity, Jr., president, reported.

The company produces die castings for bathroom fixtures, consumer items, the automotive industry, and a variety of other metal products.

AWIMA to hold summer meeting at Mackinac Island

The executive committee of the American Washer and Ironer Manufacturers' Association has set July 15, 16 and 17 as the dates for the organization's annual summer meeting. It will be held, as in 1947, at the Grand Hotel, Mackinac Island, Michigan.

Locke Incorporated appointment

The board of directors of Locke Incorporated (new name for Locke Insulator Corp., Baltimore, Md.) has announced the appointment of E. M. Skipper as vice president of manufacturing.

Skipper joined Locke in 1928 in the design engineering department,

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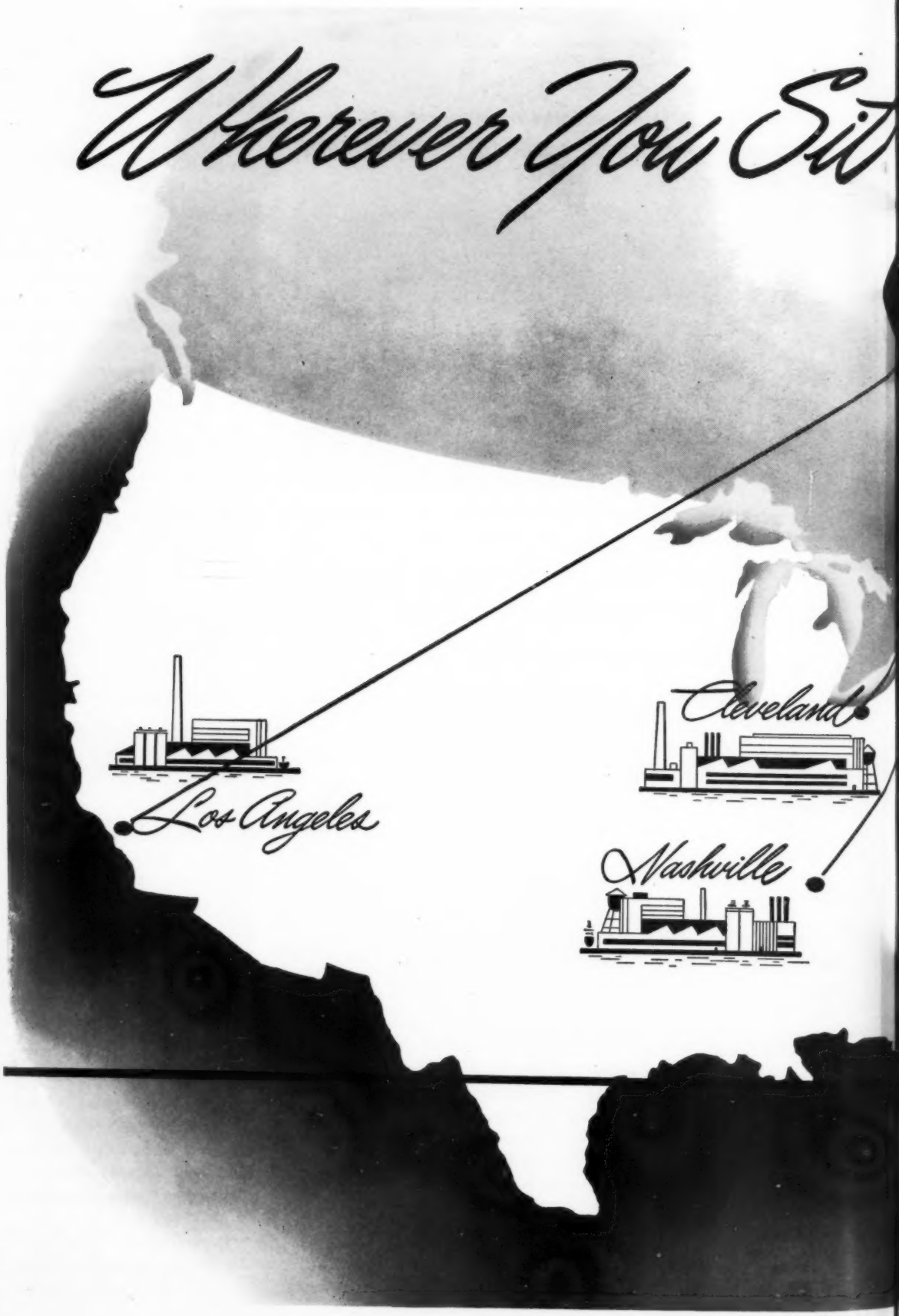
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Now you can enjoy the benefits of four Ferro plants—strategically located, fully equipped and each a convenient source of supply.

Better yet, each Ferro plant is "backstopped" by the other three—triple assurance that your orders, come what may, will be expedited with little or no delay.

Moreover, when you *buy Ferro,* you get the added advantages of Ferro Research, Quality-controls and the consulting service of your Ferro Representative—the man who knows most of the "answers" on Porcelain enameling or can find, through his associates, those other answers that may be needed.

Yes, it's little wonder that more and more enamelers are making Ferro their "one-stop" source for all Porcelain enameling requirements. Are you one of them?

FERRO ENAMEL CORPORATION
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→ *from Page 51*

and in 1934 was promoted to plant engineer. Four years later he was appointed manufacturing engineer, and in 1945 advanced to assistant works manager.

Maytag regional manager assignments

Four new regional manager assignments have been announced by The Maytag Company, Newton, Iowa.

F. T. Rooney

D. Miller

D. M. Roush

J. D. Nelson

Dennis Miller has been placed in charge of the District of Columbia and surrounding area; Francis T. Rooney will represent the company in the upper peninsula of Michigan and a small area in Wisconsin; David M. Roush takes over Vermont and adjacent areas in New Hampshire and Massachusetts; Dave Nelson takes over nine counties in southern Michigan.

Store modernization show announces college competition

A competition among college architectural students for the design of a model "shopping center of the future," conducted by the Store Modernization Show in cooperation with the American Institute of Architects, was announced by John W. H. Evans, managing director of the show.

A committee of the AIA and retailing executives will judge the entries, with winning entries to be exhibited first at the 2nd Store Modernization Show at Grand Central Palace, New York City, July 6-10, and later to tour key cities of the United States and Canada.

ACS section news flashes

Pittsburgh Section of the American Ceramic Society will hold its annual Ladies Night, Friday, May 21. As a climax to the 1947-48 season, the entertainment committee planned a dinner-dance at Bill Green's Supper Club.

Rutgers Ceramic Club and Student Branch of the ACS was addressed recently by Dr. Lincoln T. Work, director of research, Metal & Thermit Corp., on the subject "Particle Size and Its Industrial Applications."

University of Illinois Student Branch new officers are: Walter Stuenkel, president; Floyd Maupin, vice president; Allen Wherry, secretary, and Richard Ames, treasurer.

Maypole Party

Chicago enamelers are reminded of their Club's all-day Maypole Party, Friday, May 21, at the Cherry Hill Golf Club, 191st St. and S. Kedzie (near Flossmoor).

Ferro opens new clay plant

Ferro Enamel Corporation, Cleveland, Ohio, has announced the opening of its new clay processing plant at Nashville, Tenn. The new plant was built for the processing and blending of domestic clays for porcelain enameling.

C. D. Clawson, Ferro president, has stated that distribution from the new facility will be nationwide.

New table top label announced by PEI

Genuine
PORCELAIN ENAMEL
"THE LIFETIME FINISH"
THIS TOP IS GUARANTEED BY THE MANUFACTURER TO CONFORM TO THE PORCELAIN ENAMEL INSTITUTE SPECIFICATION NO. 161
GLASS-HARD · STAINLESS
RUST-PROOF · ODORLESS
FADELESS · BURN-PROOF
TO CLEAN - wash with soap and water

A new label for identification of genuine porcelain enamel table tops has been made available to eligible manufacturers of these products by the Porcelain Enamel Institute. The

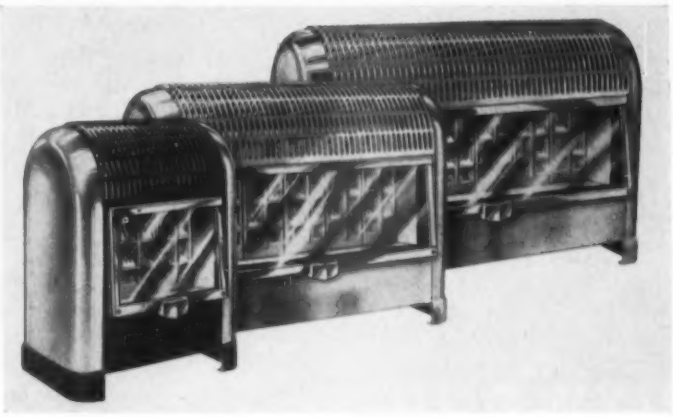
label is printed in red, black, and silver.

Harold Gray visits S. America

Harold B. Gray, vice president, Vitreous Steel Products Co., and general manager of the Nappanee plant, has just returned from a trip to South America.

Accompanied by Mrs. Gray, he went via train to Miami, flew to Balboa, Guayaquil and to Lima, Peru. The return trip, by Grace Line, from Callao to New York was reported most enjoyable.

Robinson Heaters offer porcelain enameled space heaters



Harry J. Robinson, formerly with Tennessee Enamel Manufacturing Co., is president of Robinson Heaters, Inc., 1397 North Grant Ave., Columbus 1, Ohio.

The firm is currently producing two lines of porcelain enameled "Radaire" heaters. One is a brown porcelain enameled heater for general room space heating, and the other is a black and white porcelain enamel model for bathrooms.

According to Robinson, the firm is introducing three new radiant type heaters for the 1948 market. Feature of one of these new models is a heat resisting plate glass "guard" which, together with other design features, combines heat by convection, radiation, and conduction.

Wells named president of Clyde Porcelain Steel

Charles C. Wells, Chicago industrialist, was named president of Clyde Porcelain Steel Corporation at a stockholder-directors meeting. The board of directors also was increased from three to seven members.

Meeting of North Carolina ceramic industries, May 8

A meeting of the North Carolina Ceramic Industries will be held at North Carolina State College, Raleigh, May 8, according to announcement by W. W. Kriegel, head of the school's ceramic engineering department.

Included on the program will be a "discussion of dryer problems," by R. R. Robinson, president, Robinson Ventilating Co., Zelienople, Pa., it was stated.

Fred J. Heid, formerly vice president in charge of sales of Verson Allsteel Press Company of Chicago, has been appointed general sales manager of Ekstrom, Carlson & Co., Rockford, Ill., manufacturers of high production metalworking machinery, it has been announced.

American Wheelabrator appoints sales engineer

George F. Burditt has been appointed sales engineer to represent, with John N. Harper, American Wheelabrator & Equipment Corp., Mishawaka, Ind., in the Pittsburgh, Pa., territory. He is a graduate mechanical and industrial chemical engineer from Kansas State College.

Eastern enamelers meeting

The Eastern District Enamelers Club will meet Saturday noon, May 15, at the Sylvania Hotel, Philadelphia, according to Howard Williams, secretary. The program includes a talk, "Human Engineering," by F. H. Guthrie, president of Newark Stove Co., and the showing of a Carnegie-Illinois Steel Corp. film on the processing of steel.

Bendix reports highest sales in firm's history

Dollar sales totaling $81,325,286 in 1947, highest in the company's history, were reported in March by Bendix Home Appliances, Inc., South Bend, Ind., in the firm's tenth annual statement. Sales in 1947 represented an increase of 164 per cent over sales for 1946.

Fullerman advanced by Mullins

Clarence T. Fullerman has been appointed regional manager of the northern Ohio and western Pennsylvania territory for the Youngstown Kitchen division of Mullins Manufacturing Corp., Chas. A. Morrow, vice president in charge of merchandising, announced. Fullerman has

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Consult with our packing engineers on product protection — Our designing and testing laboratory is at your service, without obligation.

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Plants at: Helena, Ark. • Greenville, Miss. • Tallulah, La. • Rockmart, Ga. • Chicago, Ill.

been with the organization since 1940 as manager of the firm's experimental region and assistant manager of markets and distribution.

Perfection Stove promotions

At the annual meeting of shareholders of Perfection Stove Co., Paul T. Skove, chief purchasing agent, was elected to the board of directors.

Five members of the board received promotions at the meeting. They are, left to right in the photo: C. A. Blackburn, from works manager to vice president and director of manufacturing; C. H. Foulds, from general sales manager to vice president and director of sales; A. J. Tener, from secretary and assistant treasurer to vice president, secretary and assistant treasurer; Marc Resek, from chief engineer to vice president and director of engineering; Paul T. Skove, and D. S. Smith, from vice president and treasurer to executive vice president and treasurer.

L. S. Chadwick was reelected president and chairman of the board, and H. C. Crowell was renamed vice chairman. Skove will continue as assistant secretary.

Stewart-Warner appoints instrument distributor

Appointment of Alemite Company of Montana, Billings, Mont., as distributor of products of the instrument division of Stewart-Warner Corporation, has been announced by George Zahn, division sales manager.

Tachometers, gauges and other Stewart-Warner instruments for industrial markets will be sold and serviced by the Billings firm.

PEI executive group recommends new committee on shipping and packing

Appointment of a shipping and packing committee to study and report on methods of packing, improving containers, etc., and to consult with carriers regarding shipping rates, was a major recommendation of the executive committee of the Porcelain Enamel Institute at a meeting held at the William Penn Hotel, Pittsburgh, in mid-March.

The appointment of the new Institute committee was a result of growing indications that drastic increases in freight rates for porcelain enameled goods are being contemplated.

PEI annual meeting in Chicago, October 28-29

The 17th annual meeting and the 1948 sales and management conference of the Porcelain Enamel Institute will be held October 28 and 29 at the Stevens Hotel, Chicago.

The sales and management conference will be the second such meeting held by the Institute with the purpose of placing on market development and merchandising techniques emphasis equal to that which is given to the industry's technical developments at the PEI annual forum, it was stated. The conference will be held in conjunction with the Institute's annual meeting during which time the election of officers will be held.

Lustron names superintendent and erection manager

Appointment of Ernest Olsen, as general superintendent, and Charles S. Trowbridge, as manager of erection and service division, was announced by Carl G. Strandlund, president.

Ernest Olsen

C. S. Trowbridge

Prior to his appointment, Olsen was with Schwitzer-Cummins Co.,

Indianapolis, Ind., and before that with Oliver Farm Equipment Co.

Trowbridge's recent connections included Fisher Body and General Motors. Earlier he was with Detroit Steel Products Co. for 15 years.

Standard Oil's new emblem utilizes porcelain enamel

A new oval emblem in red, white, and blue, bearing a torch and the single word, "Standard," is replacing the old rectangular dark blue signs used by 17,000 dealer stations in 15 north central states to announce "Standard Service," the Standard Oil Company (Indiana) has announced.

The face and collar of the new emblem is porcelain enamel. The emblem is 19 feet from the bottom of the standard to the top of the oval. The oval (5 ft. x 7 ft.) is illuminated for night identification.

Legibility, in any weather and against any background—rural or urban, and modern design are the principal reasons for the change in the emblem, it was stated.

Merchandise Mart market promotion manager dies

Joseph N. Stewart, 47, advertising and market promotion manager of The Merchandise Mart, died suddenly, March 20, at his home in Mundelein, Ill.

He joined the Mart staff as a space salesman in May, 1936, and the following year was appointed market promotion manager.

B. T. Sweely, vice president and director of research, Chicago Vitreous Enamel Product Co., has announced the addition of Otto C. Linhart and Gordon S. Douglas to the Chicago Vit research laboratories staff, chemical division.

Locke appointment

J. W. Yewell has been appointed superintendent of the ceramic division of Locke Incorporated, Balti-

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Central enamelers tour Westinghouse plant

ONE of the most interesting meetings on the schedule for the Central District Enamelers Club was held at the Westinghouse Electric Appliance Division, Westinghouse Electric Corporation, Mansfield, Ohio, on Friday, April 9.

The fact that the Enamel Club members are interested in meetings of a practical nature could have no better proof than the attendance (almost 250) which set a new record for the Club for post-war meetings.

Westinghouse plays host

On invitation from Westinghouse, the group enjoyed a fine dinner in the company dining room at 6:30 p.m. This was followed by a group meeting in the company's auditorium, where the club was addressed by C. L. Van Derau, works manager. The assemblage was then broken into small groups for a tour of the large household products plant.

From 100 to 7200 employees

In his talk to the key enamel plant men, Mr. Van Derau traced briefly the rapid growth of the porcelain enameling industry which is paralleled in the growth of the Westinghouse organization at Mansfield. In 1918, the plant employed 100 people; it now has 7200 employees on the payroll.

Some conception of the size of the operation can be drawn from the fact that the plant uses 44 carloads of material per day, has a monthly steel consumption of 18,000,000 lb., and uses over half a million dollars worth of frit per year.

The speaker stressed the point of specialization in a plant of these proportions. For instance, in the enameling plant production, all technical

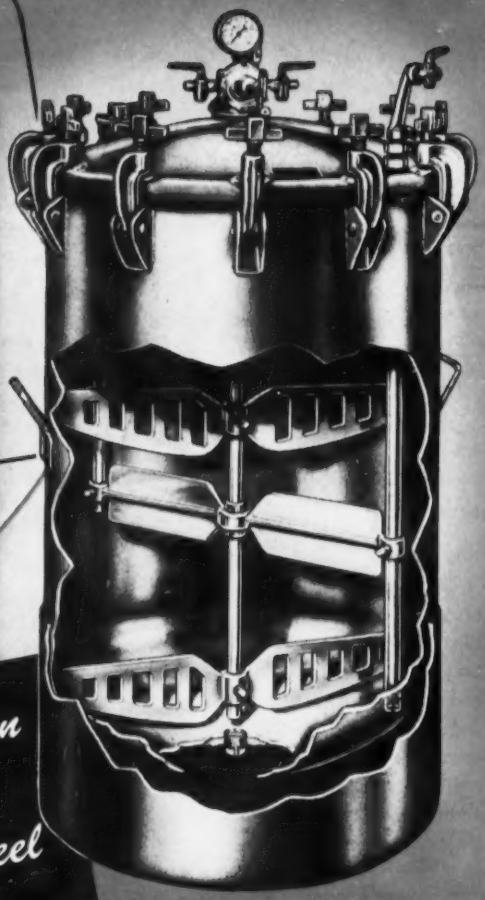
This photograph shows the group of enamelers who toured the plant of Westinghouse Electric Corporation, Mansfield, O.

a new

CORROSION-PROOF

pressure material tank

FOR CERAMIC FINISHES



"If it's made by Binks, it's made right".

J. L. Roche
President

Copper silicon alloy and stainless steel

The shell, head and paddles of this Ceramic material tank are made of strong, durable copper silicon alloy. The agitator shaft and the material tube are of stainless steel. Both air and electric driven motors are available for the agitation of this tank.

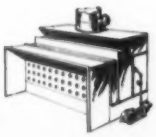
Binks designed this exceptional pressure material tank especially for ceramic finishes. All parts are of corrosion-proof materials, manufactured to the usual high Binks standards. There are no coatings or platings used in this tank. These would wear off in time and cause trouble. All parts are corrosion-proof *all the way through*. Rust cannot form in this tank! There is no chance for impurities to get into the frit.

The additional cost of this special tank is a small premium to pay for complete and permanent protection against the formation of rust which may spoil an entire tank of costly frit. The superior agitation equipment of this tank keeps the frit of uniform consistency. This, coupled with the corrosion resistance of the tank, greatly reduces the number of rejects . . . and results in still further economies.

EVERYTHING YOU NEED FOR COMPLETE CERAMIC FINISHING

Ceramic Spray Guns

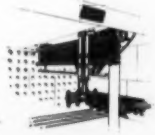
Oil and Water Extractors



Ceramic Spray Booths

Air Compressors

Hose and Accessories



Automatic Spray Finishing

Binks **MANUFACTURING COMPANY**
3122-40 Carroll Avenue, Chicago 12, Illinois

NEW YORK DETROIT LOS ANGELES ATLANTA BOSTON CLEVELAND DALLAS MILWAUKEE NASHVILLE PHILADELPHIA PITTSBURGH ST. LOUIS SAN FRANCISCO SEATTLE WINDSOR, ONTARIO, CANADA

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control is handled by control men. Production men have no responsibility or control over chemical solutions. It is up to them to see that production is maintained. He outlined the company's policy in bringing young men into the organization, training them in specialized work, and teaching them to *work together* as a team. He said, "An individual must put the company first if we are to get any place. Then, as the company succeeds, the individual succeeds also."

There is a three-man line for every job, for as promotions come there must be someone trained for replacement.

Importance of budget controls

Mr. Van Derau hit on an important point in relation to enameling plants when he stressed the importance of budget controls. It is conceded that many plants within the industry do not know costs. Through the use of charts and a down-to-earth, easily understood explanation, it was shown how easy it is to know at nine o'clock in the morning whether the plant has made money the day before *if* a proper budget control system is installed. Such controls do not have to be complicated to be effective.

It was pointed out that accounting reports are important, but from the standpoint of day-by-day activity in a porcelain enameling plant, a report that is from two to six weeks old is of little benefit for governing today's operation. A good budget system should report the *next day* in terms that make immediate correction of difficulties possible. The day-by-day control system catches inequalities or off-balance production costs at a time when corrective measures are important. In the words of the speaker, "There is nothing wrong with the plant man making a mistake *if* he doesn't repeat the same mistake. Proper budget controls prevent such repetition."

Twenty-two miles of conveyors

By the time Enamel Club members had traversed the route through the many specialized product divisions, it is probable that some wished that they could have been traveling on the extensive conveyor system to save wear and tear on their "dogs."

Needless to say, the plant tour formed a most interesting part of the program for the practical plant men who took the journey. *Finish* feels that Westinghouse is to be commended on their broad policy which encourages the interchange of plant "know how" for the ultimate benefit of the entire porcelain enameling industry.

NEWS → *from Page 58*

more, Md., according to an announcement by E. M. Skipper, vice president. Yewell was formerly assistant superintendent of the firm, a General Electric affiliate.

Veteran Tappan employees honored

Eleven employees of Tappan Stove Company, who have completed 25 years of service, were honored at

Knowledge and Experience

Build Quality Products

High grade industrial products can be manufactured only with the teamwork resulting from knowledge and experience.

We have the ability and the facilities at Lawndale to furnish the dependable porcelain enamel jobbing service required by manufacturers.

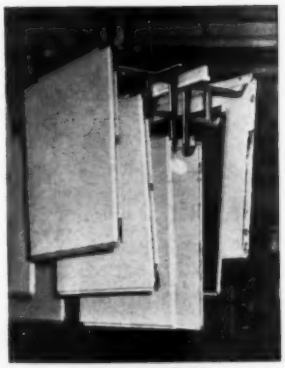
Check with us in the design stage of your next production job.

Lawndale Enameling Company
1137-1139 West 14th Street
Chicago 8, Illinois

•

Telephone CHEsapeake 5495

FAHRALLOY BURNING TOOLS
for Greatest Ultimate Economy



You get maximum service life and lowest cost per hour-of-service with Fahralloy Burning Tools. Racks, bars and fixtures of Fahralloy grade F-5 (65% nickel, 20% chromium) show practically no weight loss over long periods, and an absolute minimum of warpage and breakage. High nickel content enables them to withstand repeated thermal stresses.
Fahralloy Grade F-1 (35%Ni.—15% Cr.) is available if desired.
Our standard patterns cover most requirements, or we can design ideal tools for your needs.
Send for new 24-page Burning Tool Cat. No. 47.

THE FAHRALLOY COMPANY
149th & Loomis Sts.
Harvey, Ill.

the second annual banquet of the Tappan Quarter-Century club held in Mansfield, Ohio.

Don Armstrong to Lustron

Appointment of D. W. Armstrong as assistant manager of the ceramics division of Lustron Corporation, manufacturer of porcelain enameled all-steel homes, was announced by Carl G. Strandlund, president.

Armstrong joined Lustron after a varied career in ceramics. He attended Ohio State University in 1931. In 1934 he joined Davidson Enamel Co., Lima, Ohio. Later he was in charge of control for Benjamin Electric Mfg., Des Plaines, Ill. As service engineer for Pemco Corporation, he had charge of Indiana and Ohio. From 1942 to late 1945 he was subcontract supervisor for Westinghouse Electric Corp., Lima. He then returned to Davidson Enamel as assistant enameling superintendent.

EEI 14th annual sales conference

(Continued from Page 45)

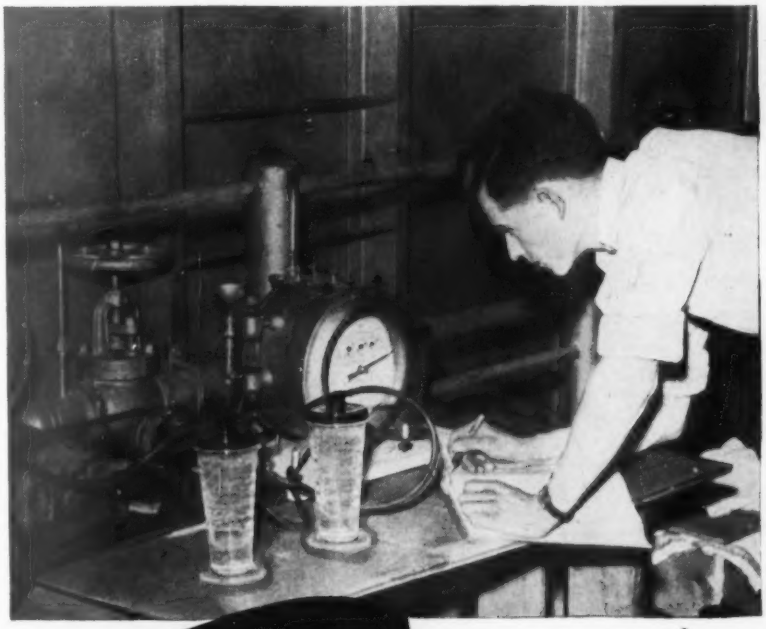
the Curtis award is designed to encourage high standards of illumination, applied in accordance with Better Light Better Sight principles, in all commercial structures.

New program on promotion of all-electric kitchen

A new promotional and educational program on an all-electric kitchen, to be used by utility companies and local elements of the electrical industry to encourage sales, was introduced at the conference.

Developed by the Institute's electric kitchen and laundry committee, the program will be ready for use by early fall of this year, it was said. The program was presented by H. H. Brenan, Pennsylvania Power & Light Co., Allentown; T. O. McQuiston, Duquesne Light Co., Pittsburgh, representing the committee; and Harry E. Warren, The Ralph H. Jones Co., New York City, the committee's advertising agency.

The program is designed to be sufficiently flexible to permit the utilities to use the materials and suggestions in developing a "tailor made" plan to fit individual merchandising situations and local conditions. Its immediate goal is consumer education, to bring to the American family knowledge of the advantages of electrical living.



PICTURE OF PORCELAIN ENAMEL *Scumming* BEING ELIMINATED

Again, Ferro does it! This time it's the effective elimination of *scumming* due to atmospheric contamination. Through a whole new series of tests, Ferro engineers can evaluate plant atmospheric conditions, including furnaces and driers... determine the exact amount of harmful sulphur-bearing gases... locate the source of contamination... and provide the solution —all within a few days.

This, and more, is available through Ferro's ANALYTICAL CHECK-UP SERVICE—a service that has brought new economies to Porcelain enameling. Ask your Ferro Representative to tell you about it. Or write direct for further details.

FERRO

ENAMEL CORPORATION

4150 E. 56th St. • Cleveland 5, Ohio

New industrial literature

Guide to infrared applications

Radiant heat for industrial processing is described in a new booklet, "Modern Baking, Drying, Heating with Industrial Infrared Lamps."

The 16-page booklet tells why infrared provides more heat per dollar of investment. It discusses the four major types of installations — the portable or non-oven type, the single-walled oven, the double-walled oven, and the insulated oven. Application data to aid in planning installations is included.

Copies of the booklet (A-3817) may be secured from Advertising and Sales, Westinghouse Lamp Division, Bloomfield, N. J.

Manual on course in quality control

A manual outlining a short training course in statistical quality control, designed for the instruction of managerial personnel in manufacturing firms, is now available.

The manual was prepared by Holbrook Working and Edwin G. Olds in 1944 while associated with the Carnegie Institute of Technology, Pittsburgh, Pa. At that time Carnegie Institute was developing quality control techniques for application in war industries under a contract with the Office of Production Research and Development.

The book is on sale at the Office of Technical Services, Department of Commerce, Washington, D. C.

Hydraulic and mechanical press selection

A comprehensive and functional analysis of "How to Select a Press" is given in a new 20-page bulletin just released.

Bulletin G-47 was prepared as a ready guide to help press users determine what type of press is most suitable for specific job requirements and what methods of power application are most efficient. Covered are single, double, and triple action mechanicals and hydraulics, open back inclinables, post type hydraulics, knuckle joint presses, forging presses, high-speed high production models and fully automatic transfer feed presses.

Charts and formulae are shown for computing pressure requirements for blanking, drawing, blankholding, forging, coining and ironing.

Of particular interest is a ready reference table which makes it possible to determine slide velocities at various stroke positions from mid-stroke to bottom stroke position.

Bulletin G-47 is available on request to Verson Allsteel Press Co., 1355 East 93rd Street, Chicago, Ill.

Book on scientific equipment

A fluorescent balance illuminator and a glass tubing cutter are two of many items of laboratory equipment shown in the "Eberbach Announcer of Scientific Equipment."

Write to Eberbach & Son Company, Ann Arbor, Mich., for Announcer No. 48-3-30.

New Supplies and Equipment

Low-temperature control

Development of a new instrument which makes possible accurate and close control of low-temperature processing was announced in March by Brown division of Minneapolis-Honeywell Regulator Co.

"The new instrument," according to the report, "is a low-temperature radiation pyrometer which has been tested in continuous curing ovens. The tests have shown that low-temperature radiation control reduces rejects, speeds output, assures uniform quality and reduces power losses."

Continuous tumbling machine

The development of a new "Continuous Wheelabrator Tumblast" for high production blast cleaning has been announced.

By utilizing the combination of tumbling and longitudinal travel of the work, the machine is said to offer thorough cleaning and uninterrupted production. It is said that no time is lost for starting, stopping, loading, and unloading, as in the conventional type batch mill, since parts are fed into and discharged from the machine in a continuous flow.

Details of construction and operating data are contained in Bulletin 514. A copy of the bulletin, as well as photographs of the machine, will be sent on request to American Wheelabrator & Equipment Corp., Mishawaka, Indiana.

Newly designed safety goggle

The new "Cesco Spec-Lite Goggle," of entirely new design, has a forehead rest, plus balanced temple suspension. The weight of the goggle is 1 ounce.

The manufacturer states that coverage up and down and laterally protects the entire eye area from sparks, light impacts, liquid splashes and other hazards.

For complete information, write Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12, Ill.

Induction motors in popular ratings available for immediate delivery

Because the company's current production of single-phase, integral-hp motors — 1 to 7½ hp — has been increased five times that of prewar level, these motors are now largely available for immediate delivery in the ratings principally demanded, according to W. H. Henry, manager of General Electric's Small and Medium Motor Divisions.

Cooperative research effort

results in production of smokeless coal heater

THE combined research efforts of a number of stove manufacturers, Battelle Institute, and Bituminous Coal Research, Inc. have evolved a more efficient method of heating with coal in the form of a smokeless heater.

Porcelain enameled jacket

The new heater incorporates favorable features which were developed during laboratory and consumer acceptance tests. One of these features of great interest to members of the enameling industry is the heater's *porcelain enameled* jacket.

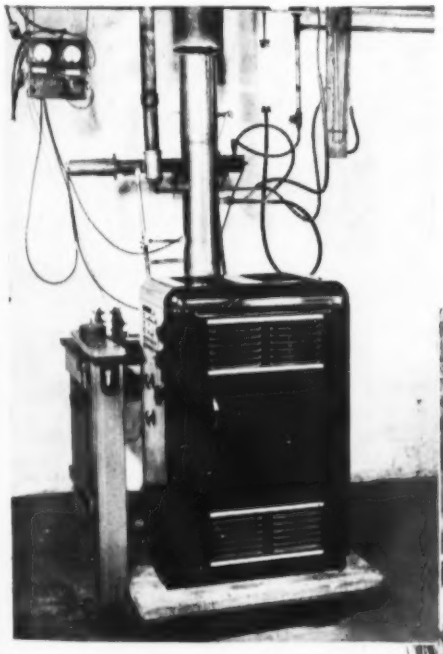
Research on the smokeless heater was begun more than two years ago. Field trials were conducted by lending out a number of heaters and interviewing the users from time to time to determine their reactions.

The new model heater, BCR-2C, weight 285 pounds, 160 pounds lighter than the earlier BCR-1. It is 43¼" high, 27¾" wide and 18" deep. Total fuel capacity is 70 pounds. The period between refuelings is 12 to 24 hours during normal winter weather. Battelle tests rate the heater at 36,000 Btu per hour over a 12-hour period. It is said to burn any type of bituminous coal smokelessly.

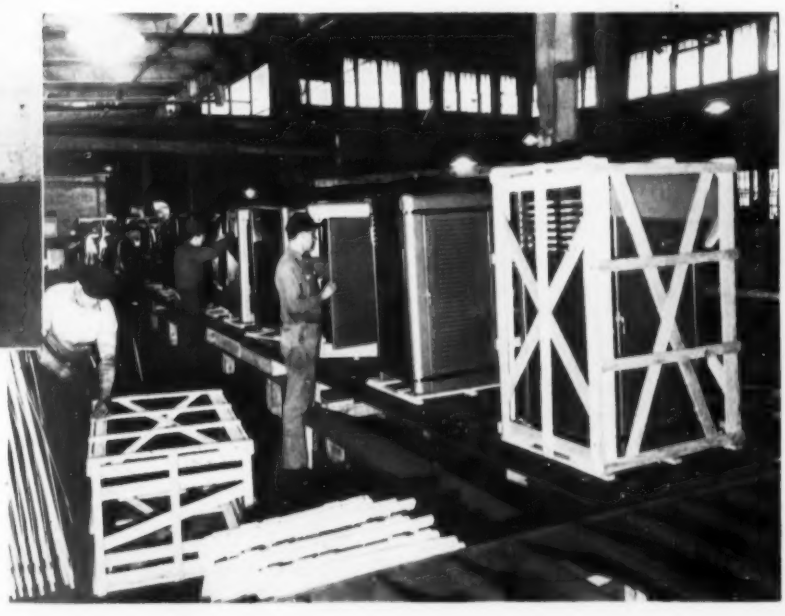
Where the former model had ten special refractory shapes, the current heater has only one. Steel fabrication and assembly have been greatly simplified. Refractories at vulnerable points have been replaced by low-alloy cast iron and the dump grate has been redesigned to eliminate congestion of ashes under the arch. The firing door fume vent has been improved to eliminate the emission of fumes when the door is opened.

Battelle engineers' report

Battelle test engineers report that in calorimeter tests, an average of 4.25 pounds of coal per hour were burned in the new heater at rated output, when using coals ranging from strongly-coking to free-burning bituminous types. The average thermal efficiency was 64%. It was necessary to shake the grates only once during the 12-hour tests. The heater



Left: Smokeless heater model BCR-2C on test block at Battelle Memorial Laboratory, Columbus, Ohio.



Right: Assembly line for smokeless heaters at Conlon-Moore Corporation, Moore Division, Joliet, Illinois.

exhibited satisfactory self-feeding characteristics with all coals used and no puffing occurred during any of the tests.

Among the manufacturers who have developed and produced production models are Oakland Foundry Co., Belleville, Ill., and Moore Division, Conlon-Moore Corporation, Joliet, Ill.

Manufacturers participating in Bituminous Coal Research work include: Allen Manufacturing Co., American Stove Co., Atlanta Stove Works, Conlon-Moore Corp., Gray and Dudley Corp., Indianapolis Stove Co., Kalamazoo Stove & Furnace Co., King Stove & Range Co., Newark Stove Co., Noma Electric Co., Oakland Foundry Co., Rheem Manufacturing Co., and Tennessee Stove Works.

Why G-E specifies porcelain enamel in its dealer identification program

(Continued from Page 23)

have adopted it. Illuminated projecting signs of porcelain-finished steel, and porcelain and steel truck and roadside signs are another important feature.

Carrying its program further, G-E produced a full-color book presenting a scientific approach to better appliance merchandising. The suitable location, space and type of store are discussed, with sample interior layouts for each of the basic types. Display technique, lighting, floor and ceiling treatment, fixtures, color combinations and complete display kitchens and laundries are suggested.

General Electric Company keeps retailers informed periodically on new identification pieces available, along with suggestions on their use.

GAMA holds 13th annual meeting

(Continued from Page 39)

the President's address and a talk, "Merchandising as an Operator Sees It," by Hudson W. Reed, AGA president and president of The Philadelphia Gas Works Company. H. Leigh Whitelaw, managing director of GAMA, then presented a detailed report of Association activity.

On Wednesday morning there were four major addresses: "L-P Gas—Restrictive Codes and Regulations," by L. A. Brand, chairman of the Committee on Codes and Regulations, and vice president of Empire Stove Company; "Potential Effect of Present Gas Research," by E. S. Pettyjohn, director of the Institute of Gas Technology; "The Business Outlook," by Edwin B. George, economist, Dun and Bradstreet, Inc., and "An Analysis of Sales and Distribution Problems," by Alfred G. Blake, partner, Rogers and Slade, Management Consultants.

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Frank J. Nugent	Vice President
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Henry Honer	Chairman, P.C.G.A. Manufacturers Section
M. M. Kennedy	Alt. to Chairman, P.C.G.A. Manufacturers Section
C. A. Gabriel	Vice Chairman, P.C.G.A. Manufacturers Section
R. H. Hinckley	Alt. to Vice Chair., P.C.G.A. Manufacturers Sec.

Contrasting luncheon speakers

Your reporter heard Dr. Kenneth Walker at Tuesday's luncheon present "Live Together or Live Not." Dr. Walker's vivid description of what may be expected if we reach the point of atomic and bacteriological warfare was not pleasant to hear, but presented food for thought for any business executive.

In contrast, Arthur H. Brayton, humorist, was scheduled for Wednesday's luncheon.

Division and group meetings

Afternoon meetings on both Tuesday and Wednesday consisted of Division and Group meetings, including the following:

Tuesday — Hotel, Restaurant and Commercial Gas Equipment Division; Direct Heating Equipment Division; Industrial Gas Equipment Division; Gas Clothes Dryer Division; Controls and Related Accessories Division; Gas Valve Division; Gas Boiler Group; "CP" Executive Committee; Gas Conversion Burner Group, and "CP" Manufacturers Group.

Wednesday—Domestic Gas Range Division; Gas Water Heater Division; Gas Meter and Regulator Division; Gas House Heating and Air Conditioning Equipment Division; Gas Air Conditioning Group; Gas Incinerator Group, and Gas Furnace Group.

One of the social high spots was an early evening party on Tuesday, sponsored by Owens-Corning Glass Company.

The next meeting of the Association will be held during the week of October 4, in Atlantic City.

Washington round-up

(Continued from Page 47)

into the production of pipe. This step has not been taken as yet. Producers of other housing materials, and there are shortages in the housing area of many products of the finishing in-

dustry, have not been invited to take part in the allocations program at this time.

The appointment of a Soda Ash and Caustic Soda Industry Advisory Committee was recently announced by Secretary of Commerce Harriman. The committee will consider a voluntary allocation program under Public Law 395—The Taft Anti-Inflation Act. A subcommittee or task group was also formed to work out a preliminary program. The enactment by Congress of legislation setting up a 70-group Air Force, and the demands it will make upon the aluminum industry if approved, will have an impact upon soda ash procurement.

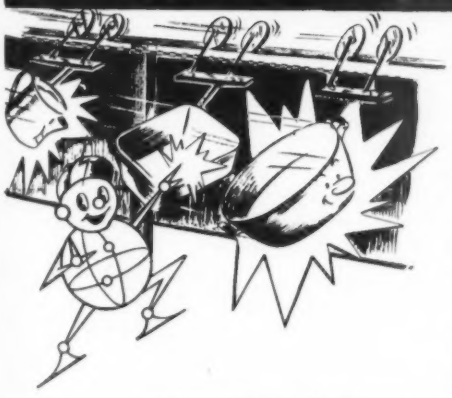
The House Banking and Currency Committee is scheduled to take up about May 1, the question of long-term extension of tin and antimony controls. Representative Wolcott, chairman of the Committee, said that hearings would start about a month before the interim authority expires on May 31. One group of the issues is expected to be the recent order of the Office of Materials Distribution, Department of Commerce, restricting uses of tinplate for some food and non-food cans. The Continental Can Company recently filed a court action asking that the order be set aside. Pressure may be applied to remove specification controls from extended authority for the distribution of tin. A manufacturer would be allocated a specified amount of tin but would not be required to account for his use of it.

The Bureau of the Census recently announced that shipments of selected *enameled* products totaled $27.8 million during the last six months of 1947 compared with $25.9 million during the first six months of the year. The July through December total included $5.7 million of receipts for enameling done on a jobbing basis and $22.1 worth of finished enameled products. Jobber receipts for the first half were also $5.7 million, but shipments by producers totaled $20.2 million of finished goods.

Value of Jobber Receipts in 1947

	Receipts	Shipments
Total	$11,431,870	$42,282,112
Signs	1,042,523	4,953,549
Stove parts	3,456,392	5,821,063
Refrigerator parts (household and commercial)	2,078,602	5,587,382
Washing machine parts	2,287,663	9,736,968
Plumbing ware	466,256	.....
Table tops		5,163,410
Store fronts	2,100,434	2,399,071
Reflectors		5,277,841
All other	.....	3,342,828

For HIGHER Chain Speeds or LOWER Firing Temperatures



Lithium Manganite is now a full fledged commercial product. It is available immediately by the ton.

Use Lithium Manganite for Ground Coats

Simple mill addition of a powerful flux—Lithium Manganite—to "hard" type frits permits significant reductions in ground coat firing temperature or increase in chain speeds.

In spite of 30-50% thinner application (only .002-.003"), users report satisfactory adherence and resistance to thermal shock. In fact, Lithium Manganite seems to exert an overall favorable influence on ground coats.

Users' monthly consumption records show that material costs are cancelled out by enamel savings. As a result, these four benefits emerge as net profit:

1. **IMPROVED COVERCOATS** because of fewer ground coat defects.
2. **LOWER FUEL COSTS** because of lower firing temperatures.
3. **COMPATIBILITY OF GROUND and COVER COATS** fired at the same temperature.
4. **WIDER CHOICE OF STEELS.**

Write for Data Sheets

METALLOY CORPORATION
RAND TOWER MINNEAPOLIS, MINN.
Division LITHIUM CORPORATION OF AMERICA, INC.

A continuous furnace enameling plant for commercial refrigerators

(Continued from Page 20)

veyor. As can be seen from this, both cover coats are identical in material and spray weight.

The 1200′ transportation conveyor takes all finished enamelware, plus all door assemblies, from the enamel plant level to the second floor assembly plant, where it feeds all assembly stations.

Box furnaces used for special parts

The two box furnaces which were in use before the continuous was installed are still available if needed. We use one of these at present to fire a few unusual shapes for which the continuous furnace has not as yet been tooled, and to serve as part of the "hospital" for any damaged parts.

The loading forks are convenient to the transportation conveyor.

Special tooling required

The problem of tooling for the large and unusually shaped parts which we normally run is one which required considerable study. One question, for instance, was the handling of 12′ long parts on a rigid hanger that could successfully negotiate the 6′ radius loops of the continuous furnace chain.

This problem was successfully answered by the burning tool manufacturer by providing a roller hanger at each end of the long bars to afford the necessary "play" at the radius turns. This gives us what might be termed "free floating bars." Coat hanger tools are then mounted on the horizontal bars to provide proper suspension points for the ware.

The fuel problem

A few points might be covered before completing the description of our new plant.

In the first place, we use gas heat through preference, but, as in many sections of the country, the gas company has the privilege of shutting off the gas at any time, and it is often necessary for them to shut it off for a 4-hour period during the day and then turn it back on. We use combination oil and gas burners so designed that we can switch fuels in a maximum of three minutes.

We dip no ground coat in our plant, all coats being sprayed either manually or automatically.

It is possible that one reason we have had little difficulty in tooling our large parts for continuous furnace operation is the fact that we use no steel lighter than 18 gauge—practically all of our parts being either 18 or 16 gauge.

Ground coat is applied at 1.70 gravity and a spray weight of 20 grams per sq. ft. Cover coat is applied at a gravity of 1.85 and a spray weight of 45 grams per square foot. Total enamel thickness is .012 to .013 (fired thickness).

The Warren Company changed from painted wood to porcelain enameled steel for its cabinets over twenty years ago, and the completion of our new porcelain enameling facilities is evidence of our company's confidence in porcelain enamel as the outstanding finish for commercial use. We have our own paint manufacturing plant and know that there are innumerable logical applications for organic finishes, but we do feel for commercial use — either for refrigerators, frozen food cases or any similar type of equipment — porcelain enameled steel is the logical finish for quality products built for long life.

The "chimney furnace"— another new use for porcelain enamel

(Continued from Page 24)

cial application the furnace forces air through pipes cast in the floor, after which the heat is vented into rooms through registers for general house distribution.

The blower is said to be so constructed that a simple attachment changes it from winter heat distributor to summer air circulator.

Economies in space and building materials may be effected through the use of this furnace which can be located centrally so that it extends upward through closets. A major economy comes from using the standard brick chimney as part of the system.

J. H. Mueller, vice president of Chimney-Furnace Corp., wrote *finish* that the heat exchange pipe unit was constructed from porcelain enameled steel as it is "highly satisfactory for our use because of its *resistance* to *heat*, *rust* and *acid*."

The unit is oil-fired and is thermostatically controlled. When used in a basement-less house, it is hidden from view by a small metal shield. (Outside dimensions of the brick casing are 25″ square.)

Concerning its application to the many small homes being built,, the makers of the space-saving "chimney furnace" say "We think we're in tune with the times."

Architects are a MARKET

(Continued from Page 27)

The architect judges products from their several definite aspects. The salesman should know all about the particular product he is shoving and be completely informed on description, performance, appearance, installation, cost, and service.

A proper *description* of the product includes what it is made of, the size in which it is manufactured, its weight, its strength.

What the product does, that is, its function or *performance*, seems an obvious requirement. It has been confused by claims which have been outlandish in known cases of the past.

If *appearance* is important, the

FACTS WORTH NOTING

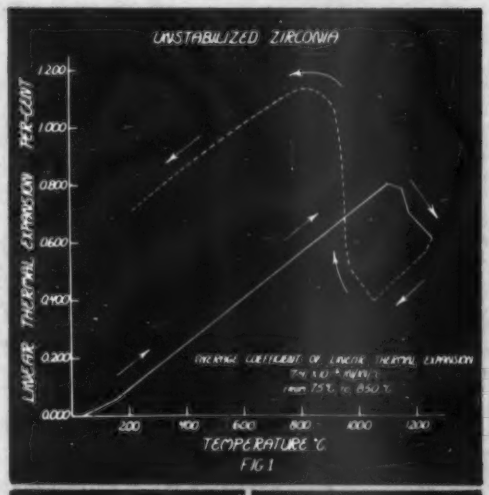
STABILIZED ZIRCONIA

Unusually High
Melting Point (2600° C)

Excellent Heat
Shock Resistance

Possessing chemical stability, hardness and resistance to chemical attack, stabilized zirconia is even more exceptional because of its excellent resistance to thermal shock. These properties make stabilized zirconia crucibles ideally suited to the melting of precious metals such as platinum and high melting point super-alloys. They offer excellent possibilities in other applications. More detailed information may be secured from TAM research and engineering staffs or by writing direct.

COMPARATIVE CHARTS POINT UP ADVANTAGES



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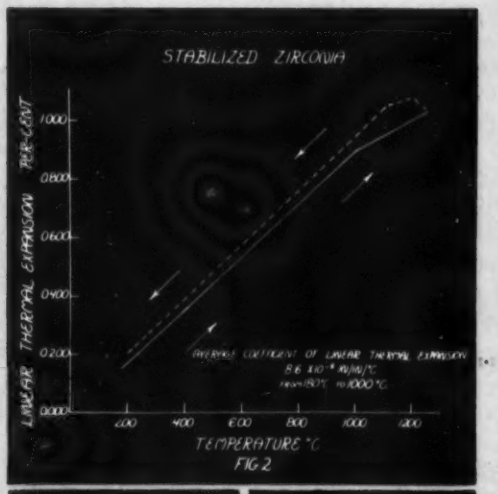
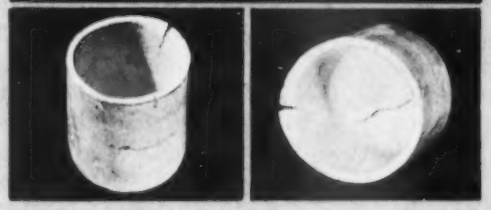
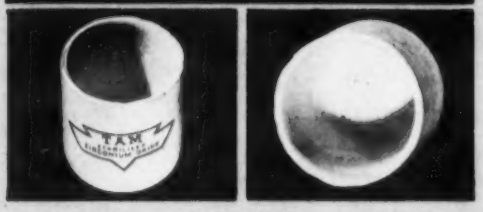


FIG 2



Unstabilized crucible cracked badly after one cycle of air quenching from 15 minutes at 2800° F.



Crucible of stabilized zirconia did not fail after more than 20 such cycles.

TAM
Registered U. S. Pat. Off.

TAM is a registered trademark.

TITANIUM ALLOY MANUFACTURING COMPANY

Executive and Sales Offices: 111 BROADWAY, NEW YORK, N. Y. General Offices and Works: NIAGARA FALLS, N. Y.

texture, color, and reflectivity of porcelain enamel should be clearly explained by the sales representative.

Proper reference literature is necessary

Detailing the *installation* of a building product is one of the most time-consuming and profit-absorbing activities of an architect's office. The lack of proper reference literature can be an insurmountable handicap to a company and its sales organization. *The architect must know how a product is incorporated into a structure.* Something often overlooked is the rather self-evident fact that products of different types and manufacture have to be fitted together. It is not enough to limit the drawings and text on installation procedure to the product that is being sold. The data should show the joining of the products with other materials with which it is likely to be used.

The matter of *cost* is a prime architectural consideration. Basically the architect slices the building dollar into segments which are in exactly the proper balance to each other for the products that are used. It is much like the "one-hoss shay" in that the perfect building would theoretically disintegrate in every part at the same instant. First cost and maintenance cost are both factors in the architect's choice.

The *service* that the manufacturer is willing to render—and this includes deliveries, design help, samples, shop drawings, job superintendence—may mean the difference between the specification of a product and its elimination from consideration.

Twenty-five thousand a day

The *fourth* element of architectural selling is the admonition to "stick to your sales story." Everyone remembers "Brewster's Millions," in which the hero had a tough time to spend a million dollars a year. One typical architectural office spends at the rate of $25,000 a day and there are many others which exceed this amount many times. The only difficulty with such purchasing power is that the architect has to produce something lasting and worthwhile for the client's money. If you waste five minutes of an architect's time, recounting interesting anecdotes of a job in which he has not the slightest interest, you may set the poor guy back hundreds or even thousands of dollars in his spending.

Don't talk about anything except the immediate problem. Stick to one thing at a time—you won't catch an insurance salesman pitching fire or auto or theft insurance until he has your name on the application blank for life insurance!

The *fifth* precept is—offer personal service. Be willing to produce samples, results of tests, or to take the right man from the architectural organization to see other jobs. Do anything that is warranted by your chances of getting the business and by the relation of the personal service demands to the size of the potential order.

See that the man or men who are designing and making working drawings have your reference literature. Such reference material should be prepared by an expert who knows the architectural language of drawings and specifications, and who understands exactly what information is needed by the designer and draftsman. *(It is also as important to leave out irrelevant data as it is to include that which is useful.)*

The moral to this story is that selling can be powerful without being aggressive, subtle without being weak. Once an architectural office is sold on your product, it is simple to keep it sold by observing the same precepts that landed the first order. Don't forget, the architect needs you just as much as you need him.

Decorative processes for porcelain enamel

(Continued from Page 34)

the printing method was formerly used, its use will probably continue extensively. Printing has been particularly adaptable for the application of small designs and for use on small and irregular shapes. Prints may be made on a bisque surface but this is not to be preferred because the designs are not clear and distinct.

The ink used for this method is prepared in a manner similar to that used for graining pastes. Pine, fat, linseed and motor oils, as well as balsams, may find usage in the vehicle. The ink as used for printing may be tackier than for a graining paste. This difference arises from the necessity of having the proper pick-up on the stamp surface rather than the necessity of having the paste cover the details of a more intricate design.

In using this process the ink is rolled smoothly on a glass plate. The design on the stamp surface picks up the ink and transfers it to the fired or bisque, usually fired, surface.

A variation in printing is used when the oil alone is picked up and transferred. The design is then colored by dusting the finely ground oxide over the wet oil. This method is cumbersome and inconvenient but has been used in special cases.

Printing may also be done by filling the design of an etched plate, similar to a graining plate, with ink. The ink is picked up by a smooth stamp or roller and then transferred to a fired enamel surface. Mechanical presses may be set up to use this method and give more perfect reproduction of design.

Screen process

The screen type of decoration has proven itself to be of untold value in regard to ease of operation and uniformity of reproduction. Many decorative effects, difficult or impossible to produce by other means, can be obtained by this process. Its accuracy of reproduction and the possible color effects make it an important method of decorating — especially in the production of enameled signs.

The application may be learned with only a small amount of special training. The design is rapidly applied using only a small amount of material. Separate firing of individual colors is usually eliminated in

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that several colors may be applied and fired simultaneously. The coatings of these screen pastes are sufficiently thin that several may be superimposed without causing trouble. The only requirement is a relatively short drying time between the different applications.

Screens may be made from silk, stainless steel or copper gauze. For most applications in porcelain enameling, screens from copper have been used. Screen making is quite specialized but several manufacturers have found it advantageous to establish departments to perfect designs for their particular lines and reproduce them on the screens. Details have been presented in various articles to cover the different methods of making screens, but it should be noted that the photographic process has afforded the means of producing decorative effects with possiblity of design and color effect practically unlimited.

Since the success of a screen design depends upon obtaining perfect coverage from a thin coating, it is necessary to use a relatively high percentage of oxides which in turn may require the use of special fluxes. The oxide content in a screen paste may run from 8 to 25% depending upon the color desired. The flux may be similar to a porcelain enamel frit but in some cases they may be the more fusible type of lead bearing composition such as used for decorating glass.

The oil used for screen pastes may be blended from such materials as pine oil, resins, and wetting agents to give a mixture having satisfactory properties. The resulting vehicle must be able to thoroughly and easily wet the color and flux particles. It must provide the paste with proper viscosity so that it will not clog the screen and yet not permit the design to run. It should dry easily and yet furnish sufficient film strength that subsequent coatings may be superimposed.

Color preparation

The color is prepared by ball milling the fritted flux and oxide addition very finely. The use of an alcohol solution or some liquid other than water may be necessary in order to prevent the formation of soluble salts. The slurry from the ball mill is screened and dried. The dried mass from the mill batch is easily broken into small lumps and passed through a pulverizing mill.

It is important to prevent the formation of soluble salts. These salts, if present, form a crust upon the color during the drying process. This crust consists of a concentration of the salts with oxide. It is quite hard and is difficult to break up. Any particles of this nature would be very troublesome in the finished paste.

The paste is prepared by running a rough mix of the color and vehicle through a roller mill. Since it is imperative to have all particles wet, several runs through the mill at closer settings are required. In cases where prepared pastes are used, it is desirable to have the paste in a more viscous state and add oil to give proper consistency as the material is used.

In operation a prepared screen is mounted on a supporting frame which is hinged either at the end or side depending upon the particular application. A spring arrangement suspended from above or as a built-in part of the frame serves to raise the screen slightly above the enamel surface which is placed below. A template is used to insure accurate positioning of the ware to be decorated. A magnet may be used as a means of leveling flat surfaces. The paste is placed on one end of the screen and drawn over the open design with a hard rubber squeegee having beveled edges. The paste is forced by the slight pressure of the squeegee down through the openings of the screen. With the openings in the screen being very close together, the slight fluidity of the paste permits the moist pattern to emerge into a continuous pattern. After passage of the squeegee over the design, the spring release will raise the screen from the decorated surface. The magnet, if being used, is shut off. The decorated piece is removed and the design allowed to dry before firing or the application of a different color. The final firing is made at cover-coat or somewhat lower temperatures.

It is desirable, the design permitting, to screen darker colors over light backgrounds due to their greater covering power. Good whites are available but they, inherently, do not

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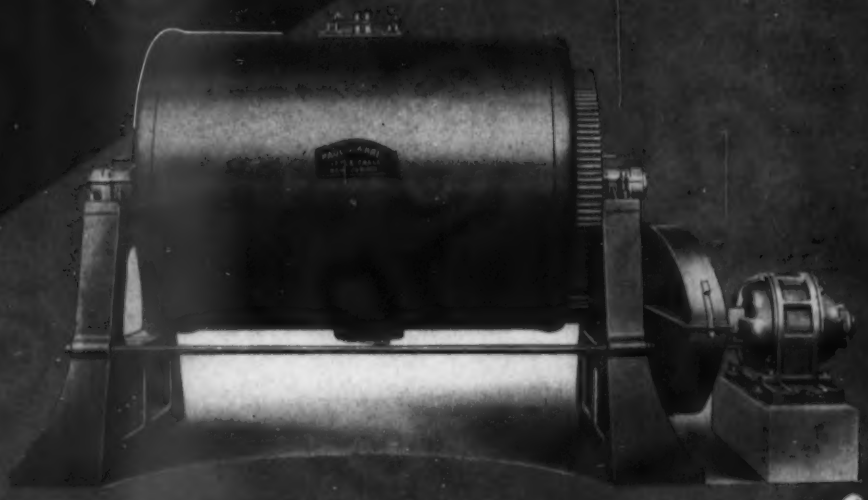

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